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WONDERS

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NATURE AND ART.

CHAP. IX.

OF GREENLAND.

THE east side of Greenland, which lies opposite to Iceland, is rendered inaccessible by mountains of ice, which rise from the sea to an astonishing height; and the west side toward Davis's Straits is little more than a confused heap of rocks, whose summits are perpetually enveloped with a mantle of snow: but the southern part is much better known, and as far as the Danish and Norwegian colonies have penetrated, the climate is temperate. During the summer season, which continues from the end of May to the middle of September, the weather is warm and comfortable; though even at this time the inhabitants are often alarmed by violent storms; and in calm weather, the coasts are infested with disagreeable fogs. Near the shore, and in the bays and inlets, the low lands are crowned with beautiful verdure; but beyond the sixty-eighth degree of north latitude, the cold is prodigiously intense; and towards the end of August all the coast is covered with ice, and remains in that state till the ensuing

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summer. Greenland is seldom visited with thunder and lightning; but the aurora borealis is very frequent and bright. At the time of new or full moon, the tide rises and falls upon the coast about eighteen feet; and it is worthy of remark, that the springs and fountains on shore, rise and fall with the flux and reflux of the ocean.

ANIMALS.

THE only domestic animals found in Greenland are dogs which frequently snarl and howl, but are never heard to bark: they are timorous, and consequently unfit for the chace, yet if not tamed when young they become remarkably wild and mischievous. The Greenlanders use these creatures to draw their sledges, yoking four, six, and sometimes eight to a sledge, loaden with five or six large seals; and it is said that they often travel sixty miles in a winter's day upon the ice.

The white bears of Greenland differ from those of other countries, in having the head and neck of a more lengthened form, and the body longer in proportion to its bulk. The hair of these animals is long, and soft as wool; the ears and eyes are small, but the teeth are large, and the limbs remarkably long. They are not only seen at land, but often on ice-floats, several leagues at sea. They are sometimes transported in this manner to the coast of Iceland; and it sometimes happens, that when a Greenlander and his wife are paddling out at sea, a white bear unexpectedly gets into their boat, and, like a passenger, suffers himself to be rowed to shore.

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It appears, however, that the Greenland bear is an animal of extraordinary fierceness, and, if attacked, will make astonishing exertions to avenge himself on his assailant. Barents had the most horrid proofs of their ferocity at Nova Zembla, where they attacked and devoured many of his seamen, even in the sight of their comrades. And an instance still more remarkable is thus narrated by the Rev. Mr. Bingley, in his Animal Biography. "Not many years ago, the crew of a boat belonging to a ship in the whale-fishery, shot at a bear at a little distance, and wounded it. The animal immediately set up the most dreadful howl, and ran along the ice towards the boat. Before he reached it a second shot was fired, and hit him. This served but to increase his fury. He presently swam to the boat, and, in attempting to get on board, reached one of his fore-feet upon the gunnel; but one of the crew, having a hatchet in his hand, cut it off. The animal still, however, continued to swim after them, till they arrived at the ship; and several shots were fired at him, which also took effect: but on reaching the ship, he immediately ascended the deck; and the crew having fled into the shrouds, he was pursuing them thither, when a shot from one of them laid him dead upon the deck."

During the summer these creatures reside chiefly on the ice islands, frequently swimming from one to another; but at the approach of winter they retire, and bed themselves deep beneath the snow, where they pass the long Arctic night in a state of torpidity. Great numbers of them, however, are annually driven from their favorite retreats, by impetuous winds or currents, and perish in the open sea.

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These bears produce one or two cubs at a time; and their maternal affection is so strong that they will rather die than desert their young in the hour of danger. We shall relate one instance which seems peculiarly worthy of attention. While a frigate, which was sent out some years ago to make discoveries towards the north pole, was locked in the ice, a man at the mast-head gave notice, that three bears were advancing over the frozen ocean, and directing their course directly toward the vessel; having, probably, been invited by the scent of some blubber of a sea-horse, which was burning on the ice at the time of their approach. The animals, which proved to be a she-bear and two large cubs, ran eagerly to the fire and drew out the flesh that remained unconsumed. The mariners then threw some other lumps of flesh upon the ice, which the old bear fetched away singly, and, dividing each lump, gave a share to each of her cubs; but as she was fetching away the last piece she received a wound from a musket-ball, and her young ones were both shot dead. The scene now became truly affecting, and the tender concern expressed by the poor animal in the last moments of her expiring cubs, might have drawn tears of pity from any but unfeeling minds. Though desperately wounded, and scarcely able to crawl to the place where the victims lay, she carried the lump of flesh thither, divided it between them, and laid her paws first upon one, and then upon the other, anxiously endeavouring to raise them up. When she found that she could neither stir them nor entice them to eat, she went off to some distance, looked back, and mourned most piteously; but this not availing, she returned, and with signs of

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inexpressible affection walked round them, pawing them and moaning. At length, perceiving them to be cold and lifeless, she raised her head towards the ship and uttered a growl of despair. This was immediately returned by a discharge of musquetry, and the affectionate animal, having fallen between her cubs, expired in the act of licking their wounds.

The usual food of these quadrupeds consists of seals, fish, and the carcases of whales; but when on land they prey on deer, hares, young birds, and other animals; and they are also said to eat various kinds of berries. When allured by the scent of the flesh of seals, they assemble in large droves, and sometimes attempt to break into the habitations of the Greenlanders; but they are easily repulsed by the smoke of burnt feathers.

Of their astonishing sagacity in searching for prey, the following story is related. "The white bears in Greenland, notwithstanding the coldness of the climate, have an exquisite sense of smelling, and sometimes when the fishermen have dismissed the carcase of a whale, and left it floating on the waves three or four leagues from the shore, these animals will stand as near the water as they can, and raising themselves on their hind legs, snuff in the air till they are at length satisfied whence the odour comes. They then cast themselves into the sea, and swim directly toward the carcase. Their flesh is said to be coarse, and the liver is extremely unwholesome; but their skins are used for coverings of various kinds, and their tendons, when split asunder, are said to form excellent thread.

Here are rein-deer, very different from those of Lapland. They are grey and shaggy, with

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horns like a hart, having three or four branches on each side, about a foot long, and two inches broad; and they have long ears and short tails. They are very lean in the spring; but in summer they grow so fat by feeding on a sort of yellow moss, that their flesh on the ribs is sometimes four inches deep.

Neither snakes, nor any other venomous creatures, can live in this climate, nor are the Greenlanders plagued with rats, mice, or beetles; they have neither ants nor bees, yet moskettos, or gnats, swarm in this country, and are extremely troublesome.

Greenland abounds with eagles, falcons, large speckled owls, ravens, and in short all the kinds of land and sea-fowl known in Norway, are seen here in amazing numbers. The rivers afford plenty of salmon, trout, and cray-fish; and the sea yields an inexhaustible variety of all kinds of fish, except oysters.

The whales are larger than in any other part of the world, some of them being two hundred feet in length, but the more usual size is from fifty to eighty or a hundred. The true whale differs from other fish that bear that name in his having no teeth, instead of which he has a kind of horny substance growing on each side of his upper jaw, consisting of a great number of different blades, some a foot broad at the bottom, and twelve or fifteen feet long, ending in a sort of fringe, similar to hog's bristles. These when split and fashioned are called whale-bone. The whale has a large flattish head, with two small eyes, not larger than those of an ox; and for his bulk he has a narrow throat, being seldom more than a foot wide, though he can open his jaws several

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fathoms. On the top of his head he has two holes, through which he draws in air, and discharges water taken in at his mouth, which he spouts up to a surprising height. His bones are hard like those of quadrupeds; but, instead of having a cavity in the middle, they are porous and full of marrow. The belly is white, but the rest of the body is black or reddish; and the flesh is coarse, hard, and mixed with sinews. The outermost skin is thin, which covers another almost an inch thick, but so tender, that it is of little defence to the animal against the assaults of its enemies. Between this skin and the flesh lies the fat or blubber, from whence train oil is procured by boiling. The whale has very strong sinews about the tail, with which he turns and winds himself as he pleases, and swims with wonderful swiftness *, making a track in the sea like a large ship under sail. These animals are much tormented with a kind of lice, which sometimes eat large holes in their bodies; and it is supposed they feel great pain before a storm, being observed at such a time to tumble about in a violent manner. As to the food of whales, it is probably small fishes of several sorts; but upon opening their bodies there is seldom found any thing but a few weeds, and a quantity of black insects like spiders, which are very numerous in

* In fishes the tail is the grand instrument of swimming, not the fins, as is generally imagined, these only serving to keep their bodies well poised and balanced, and prevent vacillation. For this reason fishes are more strong and musculous in the tail than any other part; and it is observable that the motive parts of all animals are the strongest, as the thighs of men for walking, the pectoral muscles of birds for flying, &c.

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the northern seas. Whales copulate like quadrupeds, bring forth their young alive, and suckle them with their milk.

Besides the whale there are many other remarkable fishes and amphibious animals found near Greenland, which require a brief description. Some of these, indeed, are supposed to be of the whale kind, particularly the fin-fish, which equals the whale in length but not in thickness, and has a fin on its back which the whale has not; from whence his name. He throws water higher than a whale of his size; has brown lips, which are twisted like a rope; and the colour of his body resembles that of a tench. He is extremely nimble, as well as strong; and is killed in the same manner as the whale. When these fish come upon the coast, the whales disappear.

The morse, or sea-horse, is an amphibious creature as large as an ox, with four feet, a thick round head, and a short neck, in which lies his greatest strength. His eyes are red, his ears small, and his nostrils large, from whence he spouts water. His skin is very thick and covered with hair, and from his upper jaw proceed two long teeth, which are as white as snow, and more esteemed than ivory, as they keep their colour better. This creature is very bold, making towards a boat as soon as he is attacked, and endeavouring to overset it, sometimes tearing large pieces from it with his teeth; but the seamen generally give him a warm reception, and dispatch him with lances. When whales happen to be scarce, the oil and teeth of these animals help to supply the deficiency. There is a little island, lying directly south of Greenland, remarkable for the great number of morses that frequen-

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the coast. It is called Cherry-Island; and it appears from Harris's collection, that the English have formerly made several profitable voyages thither, where in one season they got three hogsheads of morses teeth, and made twenty-two tons of oil out of the flesh of those animals. In the year 1610 the Russia company took possession of the island, and that year they killed a thousand morses, and made about fifty tons of oil: but we do not find that any ships have been sent thither for more than a hundred years past.

The monoceros, or sea-unicorn, has been mentioned in the preceding chapter, as daring to attack the largest whale with his horn; but he is not the only enemy the whale has to deal with. The sword-fish, so called from his sharp pointed upper jaw resembling a sword, pursues the whale and fin-fish with great eagerness. They are of various sizes, from three to twenty feet in length, are shaped almost like a man's arm, and their eyes are remarkably prominent. A few of them will dispatch a large whale, and when they have killed him they feed chiefly on his tongue; but sometimes they are deprived of their prey by the fishermen who are spectators of the combat.

Another enemy of the whale, and the most voracious of all, is the hay, of which there are several sorts, the largest being about eighteen feet long, and generally of a greyish colour. This fish does not kill the whale at once, but bites large pieces of fat from his sides, making holes as if they had been dug with a shovel; insomuch, that fishermen have sometimes taken whales which have had great part of their blubber torn away in this manner. The liver of the hay is exceeding large, and abounds in oil; and his flesh, when

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dried some days in the air, and afterwards boiled or roasted, is accounted tolerable food.

VEGETABLES, MINERALS, &c.

IT appears from the ancient Norwegian chronicles, that Greenland formerly produced excellent wheat, and that large oaks were found here, which carried acorns as big as apples. Some of these oaks are still to be seen in the southern parts, and in many places the marks of ploughed land are very visible; but at present the country is totally destitute of corn. Cabbages, turnips, and colewort of an excellent flavour are produced on some of the low lands; and the sides of the mountains near the bays, are clothed with wild thyme which diffuses its aromatic odours to a considerable distance. Here also are found some juniper-berries, blue-berries, bil-berries, &c. but the reader must observe, that these productions are only to be seen between the sixtieth and sixty-fifth degrees of latitude; for the more northerly parts are totally destitute of vegetation.

Greenland is supposed to contain many mines of metal, though none of them are wrought. Mr. Egede received a lump of copper ore from one of the natives who lived to the southward of the Danish colony; and he sent a large quantity of sand, of a yellow colour, intermixed with streaks of vermillion, to the Bergen company. It is highly probable that this present proved very valuable, for Mr. Egede was soon solicited by letter, to procure as much of that sand as possible; but as the mark he had set up was blown down by a tempest,

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he was never able to find the place whence he took the first specimen. This country produces rock crystals, and entire mountains of the asbestos or incombustible flax. In some parts is also found a kind of bastard marble, which the natives form into lamps, drinking vessels, &c.

FISHERIES, TRADE, &c.

THE profits arising from the bone and oil of the whales induces the English, Dutch, and some other nations to send annually a number of vessels to the coast of Greenland, where those huge creatures are taken in the following manner. When the seamen see or hear a whale spout, every one hastens to his boat, of which there are five or six belonging to each ship, and six or seven men to each boat; and having rowed till they come pretty near the whale, the harpooneer strikes him with his harpoon, which is a kind of javelin five or six feet long, pointed with steel and bearded like an arrow, to the other end whereof a line is fastened. This requires both strength and dexterity, in order to make the wound deep enough, and in the most proper place. As soon as the whale finds himself wounded, he plunges swiftly towards the bottom of the deep, and would inevitably sink the boat if the seamen did not give him line enough, which they take care to do by fastening one to another, sometimes to the length of eight or nine hundred fathoms. The man at the helm observes which way the rope goes, and steers the boat accordingly, that it may run out directly forwards, otherwise the

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boat would be overset; and the harpooneer keeps wetting the place where the line runs, lest the boat should take fire by the quickness of the motion. The other boats row before, and observe the line, occasionally drawing it in gently when they find it slacken, to prevent the whale's entangling it amongst the rocks. When the fish is somewhat spent and weakened, he rises up again for air, upon which the harpooneer gives him a second wound, and perhaps they dart several little spears into his body; till at length being quite exhausted, and fainting with the loss of blood, the men have an opportunity of approaching and thrusting a long steeled lance under his fins into his intestines, which soon puts a period to his existence. His vitals being touched, he spouts out streams of blood instead of water, and rages most furiously, beating the sea with his tail till it is all on a foam, and the noise of it may be heard at a great distance; till having quite lost his strength, he turns on one side and expires.

All the boats are now employed in towing the floating carcase to the ship, against the side of which it is fastened by ropes, one round the neck, and another round the tail. This done, three or four men go down upon the whale with a sort of irons on their feet to prevent their slipping, and with large knives cut off the fat in pieces several feet long, which are drawn up into the ship by lines and pullies. Then they cut off the whalebone from the upper jaw with a hatchet made for that purpose, and having thus stripped the carcase of all its fat and fins, the rest is turned adrift, and is welcome food to the birds and white bears. As the large pieces of fat are cut off, the rest of the crew are em-

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ployed in cutting them smaller, and picking out all the lean; after which they are put up in tubs, and stowed in the hold of the vessel. When the fishing season is over, nothing remains but to sail homewards, where the blubber is boiled and melted into oil.—In general this fishery is very profitable, but very uncertain, a ship sometimes taking seven or eight whales in one voyage, and at other times returning home without taking any thing at all.

The chief employment of the Greenlanders is fishing, for which they have very curious tackle. The boats, in which they row out to sea, are about six yards in length, and only about a yard broad in the middle, ending in a very sharp point at both extremities. They are made of very thin narrow boards, fastened together with whalebone, and covered with seal-skins. The top is covered with skin, with an opening in the middle, which, when a man has entered, is fastened close round his waist, so that no water can enter the boat. These boats go at so prodigious a rate, that a man may row sixty or seventy miles a day, though he has but one oar, which is six or seven feet long, and flat at both ends. These boats are easily overset, but this is little regarded, if the owner escapes with life. They have likewise a kind of open barges, which are also pointed at both ends, but are not very deep: these are covered with seal-skins, and are high at the extremities. They make use of them in conveying their effects in their emigrations, or when they embark for the whale fishery.

When the Greenlanders go to catch whales, they put on their best apparel, persuaded, that if they were not neatly dressed, the whale would

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shun them. Upon these occasions, about fifty men and women set out together in one of the large boats. They strike the whale with harpoons, to which are fastened lines, two or three fathoms long, made of seal-skins, at the end of which is a bag of a whole seal-skin, filled with air like a bladder, that the whale, on flying away with the harpoon in his body, may be the sooner tired, and the more easily found, the air bag preventing his staying long under water. He no sooner loses strength, than they attack him with their spears and lances, till he is killed; and then putting on their seal-skin coats, with boots, gloves and caps, laced so tight together, that nothing can penetrate them, they leap into the sea, and begin to slice off the fat, all round the body; they are even sometimes so daring as to get upon the whale's back, while he is yet alive, in order to make the quicker dispatch in killing him, and cutting away the fat.

They use much the same method in killing the seals, but in the northern parts, where the sea is frozen, they look out for the holes which the seals themselves make with their claws, of about the bigness of a shilling, that they may fetch their breath. On finding one of these holes, they seat themselves near it, and no sooner perceive the seal put his snout to it for air, than they strike him with a small harpoon, which they have ready in their hand; holding in their other hand a strap fastened to it, a fathom in length. Having struck the seal, so that he cannot escape, they cut the hole large enough to get him up through it; and as soon as they have got his head above the ice, kill him, and then lift him out. They have also other methods of catching seals: they make a

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great hole in the ice, or, in spring, find the made by the seals themselves, through which th get upon the ice, in order to bask in the su Near these holes, they place a low bench, up which they lie down on their belly, having fi made a small hole, near the large one, throu which they softly let down a pole, headed witl harpoon, a strap being fastened to it, which o holds in his hand, while another, lying upon t bench, with his face downwards, watches t coming of the seal; which when he perceives cries Ke, upon which he who holds the pole strik the seal. But in spring, when the seals lie up the ice, the Greenlanders, disguised in seal-ski with a long pole in their hands, creep towa them, moving their heads forwards and bac wards, and snorting like a seal; till coming ne their destined victims, they strike them with t pole.

In ordinary fishing, the Greenlanders ma use of hooks of iron or bone; their lines are ma of whalebone cut small and thin; and with t tackle they catch abundance of fish. Their w of fishing for small salmon, or sea trout, is follows. At low water they build small inclosu of stone, near the mouth of a river, or any oth place where the salmon enters: when the ti comes in, the salmon, which enter the river, p at high water over the inclosure, and remain the river till the water ebbs, when the fisherm way-lay them, and stop the passage, till the ti of low water, when the salmon are left on c land, and may be caught with the hand: if th are left in holes, they take them with a po headed with iron hooks, or two sharp point bones.

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The trade of this country is chiefly carried on by the Copenhagen company, who annually send three or four vessels; and the Dutch are prohibited from coming within a certain distance of their colonies. And in the year 1693, a number of English subscribers were incorporated by act of parliament, under the name of the Greenland Company. They were empowered to use the trade of catching whales in the Greenland seas, and to make bye-laws for the government of the persons employed in their service. This company, by ill management, and real losses, was reduced to the necessity of breaking up in 1707; but by a subsequent act of parliament it was declared, that any persons who would adventure to Greenland for whale-fishing should import whale fins, oil, &c. without paying any duty, and should enjoy all the privileges granted to the Greenland company.

The commodities Greenland affords for commerce, are whale-bone, blubber, sea-unicorn's horns, and the skins of seals, bears, deer, and foxes; which are usually bartered for linen shirts, coarse woollen cloth, fishing hooks, hardware, looking-glasses, timber, chests, and culinary utensils.

As Greenland can yield us no amusement on the subjects of buildings, antiquities, arts, or inventions, we shall conclude this chapter with an account of the hardships endured by eight Englishmen, who wintered there in the year 1630; and as this will give an accurate idea of the severity of the climate, we hope it will not be deemed either foreign to our subject, or unentertaining to our readers.

Three vessels were fitted out, in 1630, for

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Greenland, and one of them, a little before the time of returning, being straitened for provisions, the captain sent eight men ashore, to kill venison, with orders to follow the ship to Green Harbour, which lies a little to the southward of the place where they went ashore. These men, having killed fourteen or fifteen deer, proposed to have gone on board the ship the day following; but a great quantity of ice driving towards the shore, the ship was obliged to stand so far out to sea, that, when they came to Green Harbour, she was out of sight. Now the ships being to leave Greenland within three days, they thought it most advisable to proceed to Bell-Sound, the place of rendezvous, distant from Green Harbour about sixteen leagues to the southward. As they were under terrible apprehensions lest the shipping should be gone from thence before they arrived there, in order to lighten the boat and make the greater expedition they flung the venison into the sea; but none of them having an accurate knowledge of the coast, they over-shot the port above ten leagues; when, being sensible of their error, they returned to the northward. However, one of the company asserting that Bell-Sound lay farther to the south, they directed their course southward again; till being a second time convinced of their mistake, they turned again to the north, and at length arrived at the desired harbour; but they had spent so much time in rowing backwards and forwards, that the ships had actually sailed for England. As soon as they perceived this, they stood looking on one another as men amazed at the distress to which they were suddenly reduced, being neither provided with clothes, food, firing, nor a habitation

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to shelter themselves from the piercing cold which they must expect in so rigorous a climate. After some time, however, they began to think of the properest means to keep themselves alive during the approaching winter, in a country within twelve degrees of the pole, being the first that ever staid there during that dismal season: and perhaps history does not afford an instance of a company of men in so distressed a condition, who evinced more courage and patience, or made a wiser provision for their preservation.

The first thing they agreed on was to go to Green Harbour, where they arrived in twelve hours; and having killed near twenty deer and four bears, they brought them to Bell-Sound. Here happened to be a large booth erected, for the coopers to work in at the fishing season, eighty feet long and fifty broad, covered with tiles, and the sides well boarded. Within this they built another, whose length was twenty feet, the breadth sixteen, and the height ten, making it as close and warm as possible. They also provided themselves with wood, which they stowed between the beams and roof of the greater booth; but on taking a slight survey of their provisions, they found there was not half enough to serve them all the winter, and therefore agreed to allow themselves but one meal a day, putting their confidence in heaven, and praying for strength and patience to endure their afflictions.

By the beginning of October the nights were grown long, the weather very cold, and the sea frozen over; and having now no business to divert their melancholy thoughts, they began more than ever to reflect on their miserable condition,

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but received great comfort from their frequent and fervent devotions. And now, upon a more narrow survey of their provisions, they concluded to have only three meals a week of venison and bear, and four meals of fritters, which is a very loathsome food, being nothing but the scraps of whale's fat, which are usually flung away after they have been boiled for oil; and lest their firing should not hold out, they thought it proper to dress more meat at a time, and put it up in hogsheads.

On the 14th of October the sun left them, but they had the moon continually, and also a glimmering kind of day-light for some hours, which gradually decreased till the 1st of December, from which time to the 20th they could not perceive any day-light at all. As for light within doors, finding some sheet-lead upon one of the coolers, they made three lamps, which they supplied with oil that was fortunately left in the cooper's tent; and for wicks they made use of rope-yarn.

With the new year their twilight began to increase; and the cold also increased to such a degree, that it raised blisters on their flesh as if they had been burnt, and if they touched iron it stuck to their fingers. On the 3d of February they were cheered by the returning rays of the sun, which shone upon the tops of the snowy mountains, and, after so long and dismal a night, afforded them the most delightful scene that ever was beheld. What added to their joy was the appearance of the bears, one of which they killed at the door of their booth: but the cold was so intense, that they could not stay there to take off her skin, but dragged her into their house, and

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there cut her to pieces. Upon this they fed twenty days; and afterwards they killed several other bears, one of them six feet high; and having now plenty of food, and eating heartily two or three meals a day, they soon found their strength increase.

Towards the middle of March the days were considerably lengthened; and the fowls, which on the approach of winter fled to the southward, began to resort to Greenland again in great numbers. The foxes also, which had kept close in their holes all winter, now appeared abroad; of which our countrymen took no less than fifty, and found them to be very good food when roasted.

In May the weather beginning to grow warm, and the season for the arrival of the ships coming on, some of them went almost every day to the top of a mountain, to see if they could discern a sail; but on the 25th of that month, none of them happening to go abroad, one of them in the outward booth heard somebody hail the tent, which proved to be one of the boat's crew belonging to a ship just come from England. Of this the man had no sooner informed his companions, than they all ran out to meet their countrymen, by whom they were kindly treated; and upon their return to England, they received a handsome gratuity, and were well provided for by the generosity of the merchants.

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CHAP. X.

OF SWEDEN AND LAPLAND.

Lakes, Springs, Cataracts, Climate, Phenomena, &c.

THE kingdom of Sweden is one of the largest in Europe, and in some places the soil is tolerably fruitful; but the great number of barren mountains dispersed over the face of the country give it a disagreeable aspect. From the mountains fall innumerable rivers, or rather torrents, many of which are rendered unnavigable by the rocks and cataracts that obstruct their passage; and these form several great lakes, some of which are eighty English miles in length and twenty in breadth. If therefore we make an allowance for the mountains, lakes, woods, heaths, and marshes, with which the country abounds, the habitable part of it will be reduced to a small proportion compared to the extent of the whole.

Amongst the lakes of Sweden, that called Vetter is so remarkable in many respects, that it deserves peculiar attention. It divides East and West Gothland, being in length, from north to south, above eighty miles, and about eighteen broad in the middle, growing narrower towards each extremity. The water of this lake is very clear, and in some places so deep, that it has been sounded with three hundred fathoms of line without finding the bottom. For the most part it is free from rocks, and has but few islands, the principal of which is Visingsoe, lying in the mid-

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dle of the lake. It is often disturbed by storms, and sometimes so suddenly, that the surface begins to be ruffled before the least breath of wind is perceived, so that the cause seems to proceed from the bottom of the waters; and it is no uncommon thing for boats to be tossed by a storm in one part of the lake, whilst others at a small distance enjoy a perfect calm. That such eruptions and agitations of the water are promoted by subterraneous winds, seems to be confirmed by various phenomena; for immediately before a storm, and whilst the sky is yet clear, there is perceived a noise like thunder in the lake, which is always followed by a tempest. Of this the inhabitants of Visingsoe are more sensible than any others; for from that part of the island whence the wind will blow the next day, they hear a confused noise like the firing of cannon; and when this rumbling is heard in the east, it is generally followed by rain and hail. Some people have likewise observed, while the water has been very calm, a great number of little clouds, like so many darts, rising up from the bottom of the lake, which, uniting in the air, form a kind of mizzling rain; whence it plainly appears, that this is, in a great measure, owing to subterraneous winds. To such winds also, together with those from above, we may attribute the sudden thawing of the ice in the spring, which one minute is strong enough to bear horses and sledges, and the next is broken to pieces. The strange noise of the waters, which precedes this terrible eruption, warns travellers to make the best of their way; but those who happen to be at a great distance from land are immediately drowned, or float upon shoals of ice till they meet with relief: and what is still more

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dangerous, the least blast of wind will sometimes sink the ice suddenly to the bottom.

The violent under-currents of water observed in this lake are also very surprising, which, directly opposing the winds and waves, give the fisherman a great deal of trouble From these, as well as from its unfathomable depth and subterraneous winds, it is supposed to have a communication under ground with another large lake called Venner, about forty miles to the westward; and this seems to be confirmed by several whirlpools that lie between these lakes, two of which have been sounded, and found of a vast depth. What farther countenances this opinion is, that some years, without any visible cause, the waters increase, and decrease again the following years, as several persons have observed.

In the vicinity of this lake is a spring called the Hungry or Prophetic Fountain, because the peasants assert that it never has plenty of water but when there is a scarcity of corn the following year. It lies in a valley encompassed with sandy hills, and has this peculiarity, that in a rainy season it is commonly dry, whereas in the driest summers it sometimes overflows the highway near Vadstein. In 1685, which was a very wet year, this spring was quite dried up; but the next summer, which was not so rainy, it was observed to increase; and in the remarkably dry summer of 1705, when all the neighbouring springs entirely failed, this had a plentiful stream of water.

Cataracts, as we have already observed, are frequent in the rivers of Sweden; but the most noted of all, and the only one worth giving an account of, is that within a few leagues of Gottenburg; where a river, which issues from the

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lake Venner, falls down a prodigious high precipice into a deep pit, with a terrible noise, and with such violence, that large masts, which are floated down the river to Gottenburgh, frequently dive so far under water by the fall, if they happen to pitch endways, that some are half an hour, others three quarters, and some a whole hour before they rise up again to the surface. Many attempts have been made to find the depth of this hole, with lines of several hundred fathoms; but no bottom could ever be discovered.

With respect to Lapland, which lies to the north of Sweden, it seems in winter, upon a superficial view, scarcely fit to be the habitation of man; for in most places it abounds with rocks and mountains, whose summits seem to pierce the clouds, and are covered with everlasting snow. In other parts, the country spreads out into barren heaths, and sandy deserts overrun with moss, fern, and unprofitable weeds; one barren wild stretching beyond another, with little or no pasture growing on the intermediate spots. Besides these inconveniences, the length and severity of winter, with the cold hideous winter nights, and the depth of snow that covers this desolate region, one would imagine sufficient to deter every human being from fixing his abode in this inhospitable country. The account given by M. Maupertuis, of the rigor of this climate, when, by order of the French king, he went to determine the figure of the earth at the polar circle, is enough to make any man shudder, though his observations were made in the southern borders of the country. He observes, that in December, the snow continually falling or ready to fall, obscured the sun even during the few moments

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he might have appeared at mid-day. In January the cold was increased to that degree, that M. Reaumer's mercurial thermometer, which at Paris, in the great frost of 1709, only fell to fourteen degrees below the freezing point, was now got down to thirty-seven. The spirit of wine in the others was frozen; and if the door of a warm room were opened, the external air, in a moment, converted all the vapour in it into snow, whirling it round in white vortexes. If they went abroad, they felt as if the air were tearing their breasts in pieces; and within doors, the cracking of the wood, of which the houses are built, continually alarmed them with an increase of cold; and people are often seen in this country who have lost a leg or an arm by the frost. The cold, which during the winter is always very great, increases by such violent and sudden fits, as are almost infallibly fatal to those who have the unhappiness to be exposed to it; and sometimes sudden tempests of snow prove still more dangerous. The winds seem at once to blow from all quarters, and drive the snow about with such fury, that all the roads are in a moment rendered invisible. "How dreadful is the situation of a person," says our author, "surprised in the fields by such a storm! his knowledge of the country, and even the mark he may have taken by the trees, cannot avail him; he is blinded by the snow, and if he attempts to find his way home, is generally lost. In short, during the whole winter, the cold was so excessive, that on the 7th of April, at five in the morning, the thermometer had fallen to twenty divisions below the point of freezing, though every afternoon it rose two or three divisions above it: a difference

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in the height not much less than that which the greatest heat and cold felt at Paris usually produce in that instrument. Thus in twenty-four hours we had all the variety in the temperate zones in the compass of a whole year." In summer, when the air is warmed by the sun, this country is infested with such swarms of gnats and flies of various species, that like clouds they darken the sky, and obscure the light of the sun. These insects fix on every part of the body, bite with unremitting fury; and some of them, wherever they fix, draw blood.

Notwithstanding these disadvantages, however, nature has bestowed on these dreary regions such conveniences, that as much content and happiness are to be found there as in many countries that enjoy the most favourable climate. The mountains, which rise to a prodigious height, and are of great extent, are perhaps intended by the author of nature, to shelter the plains from violent winds; and even their wildness and irregularity appear very beautiful, especially in summer, when the alternate succession of hills and valleys exhibit a delightful variety of prospects; and there are some places, which in that season may be reckoned among the most enchanting spots in the world.

Though the days in winter are extremely short, and the nights long and tedious, this is in some measure compensated by the pleasant luminous summers, when, in the greatest part of this country, the sun is several weeks visible above the horizon. Even in winter, the brightness of the moonlight, the twinkling of the stars, and the effulgent corruscations of the aurora borealis, afford a light sufficient for most occasions of life. Maupertuis observes, that the short days are no

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sooner closed, than fires of a thousand figures and colours light up the sky, as if designed to compensate for the absence of the sun. These fires have not here, as in more southern climates, any constant situation; for though a luminous arch is often seen fixed towards the north, they seem more frequently to possess the whole extent of the hemisphere. Sometimes they begin in the form of a great scarf of bright light, with its extremities upon the horizon, which, with a motion resembling that of a fishing-net, glides softly up the sky, preserving a direction nearly perpendicular to the meridian; and most commonly after these preludes, all the lights unite at the zenith, and form the top of a crown. Arcs like those seen in France towards the north, are here frequently situated towards the south; and often towards both the north and south at once. Their summits approach each other; and the distance of their extremities widens towards the horizon. "I have seen (says our author) some of the opposite arcs, whose summits almost joined at the zenith; and both the one and the other have frequently several concentric arcs beyond them. Their tops are all placed in the direction of the meridian, though with a little declination to the west; which I did not find to be constant, and which is sometimes insensible. It would be endless to mention all the different figures these meteors assume, and the various motions with which they are agitated. Their motion is most commonly like that of a pair of colours waved in the air, and the different tints of their light give them the appearance of so many vast streamers of changeable taffety, and sometimes they line a part of the sky with scarlet.

"On the 18th of December I saw a phenomenon

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of this kind, that in the midst of all the wonders to which I was now every day accustomed excited my admiration. To the south a great space of the sky appeared tinged with so lively a red, that the whole constellation of Orion looked as if it had been dipped in blood. This light, which was at first fixed, soon moved, and changing into other colours, violet and blue, settled into a dome, whose top stood a little to the south-west of the zenith. The moon shone bright, but did not in the least efface it. In this country, where there are lights of so many different colours, I never saw but two that were red; and such are taken for presages of some great misfortune."

Another advantage is the twilight, which begins four or five hours before sun rise, and lasts as long after that luminary is set; indeed, many of the inhabitants sleep away most of the dark season, and employ the luminous part of the year, in their respective occupations; and generally suffer little in their health from this inconvenience.

MINERALS FOSSILS, &c.

SWEDEN abounds with various kinds of minerals and fossils; and among its mines there is one of silver, into which the workmen are lowered down in baskets to the depth of six hundred feet, where the roof of the mine is as high as a church, supported by vast arches of oak; and from thence they descend by ladders or baskets to the lowest part of the mine, at least two hundred and forty feet more. It is not known when this mine was first discovered, but it must have

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been wrought for many ages. The ore yields but indifferently, and requires great pains to refine it; however it annually produces about twenty thousand crowns-worth of fine silver, of which the king has the pre-emption, paying one-fourth less than the real value.—Several mines of silver and copper have also been discovered in Swedish Lapland.

Copper is found plentifully in several parts of Sweden, and is reckoned the finest in Europe. The most noted mine is of vast extent, and about eighty fathoms deep; but it is said to have suffered much by the falling in of the roof; and the working of it is attended with great discouragement, from the large share the crown has in the profit. The annual produce of this mine amounts to the value of two hundred thousand pounds, whereof the king has a fourth part, and a duty upon the remainder of twenty-five per cent. when it is exported unwrought.

Some years ago an Italian gentleman came into Sweden, with proposals to make copper a shorter and cheaper way than had formerly been practised, so as to make that in five days which before required three weeks, and with fewer hands, and one fifth part of the charcoal. A bargain was soon concluded, and he was promised a remuneration of one hundred thousand crowns. His first essay succeeded to admiration; but when he came to work in earnest, and had got his new-invented furnaces built to his mind, the miners, as he complained, picked out the worst ore, and were otherwise so envious and untractable, that he failed of success, and lost his reward: nor was it without difficulty that he obtained leave to pur-

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chase ore, and practise his invention at his own expence.

Copper is of all metals the most ductile and malleable after gold and silver, and abounds much in vitriol and sulphur. It is found in glebes or stones of various forms and colours, which are first beaten small and washed, to separate all the earthy and impure parts wherewith they are mixed. After washing they are melted, and the metal run into a sort of moulds, which form large blocks, by some called salmons, and by others cakes of copper. To render it more pure and beautiful, they melt it a second and third time, some of its coarse extraneous parts being left at each fusion, and a quantity of tin and antimony added; and in this state it is called rose-copper.—This metal is often found native in a malleable state, sometimes in beautiful branched forms or small slender fibres, and sometimes in little globular lumps, or masses of an irregular figure.

"The mines of Dalmora," says a modern traveller, "are celebrated for producing the finest iron ore in Europe. It is not dug as in the mines of tin and coal in England, but torn up by powder. This operation is performed every day at noon, and is one of the most tremendous and awful it is possible to conceive. We arrived at the mouth of the great mine, which is nearly half an English mile in circumference, in time to be present at it. Soon after twelve o'clock, the first explosion began, which I cannot compare to any thing so aptly as subterraneous thunder, or volleys of artillery discharged under ground, and the concussion was so violent as to shake the surrounding earth on every side.

"As soon as the explosions were finished, I de-

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termined to descend into the mine, though there was no way to do this but in a large deep bucket, fastened by chains to a rope. The inspector, at whose house I had slept the preceding night, took no little pains to dissuade me from the resolution, and pointed out the melancholy accidents that sometimes happened on such occasions. Finding, however, that I was deaf to all his remonstrances, he provided a clean bucket and put two men in it to accompany me—I am not ashamed to own, that when I found myself suspended between heaven and earth by a rope, and looked down into the deep and dark abyss before me, to which I could see no termination, I shuddered with apprehension, and half repented my curiosity. This, however, was only a momentary sensation, and before I had descended one hundred feet, I looked round on the scene with tolerable composure. I was near nine minutes before I reached the bottom, it being eighty fathoms, or four hundred and eighty feet deep. The view of the mine, when I set my foot on the earth, was awful and sublime in the highest degree: whether terror or pleasure formed the predominant feeling, as I looked at it, is hard to say.—The light of the day was very faintly admitted into these subterraneous caverns, in many places it was absolutely lost, and flambeaux supplied its place; I saw beams of wood across from one side of the rock to another, where the miners sat employed in boring holes for the admission of powder, with the utmost unconcern, though the least dizziness, or even a failure in preserving their equilibrium, must have made them lose their seat, and dashed them to pieces against the ragged surface of the rock beneath.—The fragments torn up by the explosion

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previous to my descent, lay in vast heaps on all sides, and the whole scene was calculated to inspire a gloomy admiration.

"I remained three quarters of an hour in these gloomy and frightful caverns, and traversed every accessible part of them, conducted by my guides. The weather above was very warm; but here the whole surface of the ground was covered with ice; and I found myself surrounded with the colds of the most rigorous winter amid darkness and caves of iron. In one of these, which ran a considerable way under the rock, were eight wretches warming themselve round a charcoal fire, and eating the scanty subsistence produced from their miserable occupation. They rose with surprise at seeing so unexpected a guest among them; and I was not a little pleased to dry my feet, wet with treading on the melted ice, at their fire.

"There are no less than one thousand eight hundred men constantly employed in these mines, and their pay is only a copper dollar, or threepence English per day. They were first opened about 1580, under the reign of John III. but have been worked constantly since that time. After having gratified my curiosity with a full view of these subterraneous apartments, I made the signal to be drawn up, and felt so little terror while re-ascending, compared with that of being let down, that I am convinced that in five or six times, I should have been perfectly indifferent to it. So strong is the effect of custom on the human mind, and so contemptible does danger or horror become, when familiarized by constant repetition."

The magnet, which is found in the iron mines of Sweden, is not properly to be considered as a distinct species of fossil, being in reality nothing

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but a very rich iron ore, found in detached masses of various forms and sizes, of a dusky iron-grey, and often tinged with a brownish or reddish colour. It is very heavy and hard, of an uneven surface, and of a firm structure, but usually with some porous irregularities within. It possesses several extraordinary properties, as that of attracting iron, and directing its poles to those of the world, of which, so far as they relate to the mariner's compass, we have already taken notice*; but for the amusement of such of our readers as may not be acquainted with the virtues and phenomena of the loadstone, we shall here enumerate some of the most remarkable. 1. Every magnet has two poles, one of which points northwards, the other southwards; and if the magnet be divided into several pieces, the two poles will be found in each piece. 2. One of these poles attracts, the other repels iron, but no other body. 3. The magnetic virtue is communicated to iron by the touch, and that very speedily; though the longer the iron touches or joins the stone, the longer will its communicated virtue hold. 4. The magnet loses none of its own virtue by what it communicates to the iron. 5. A piece of iron so touched by the loadstone, and nicely suspended on a sharp point, will settle itself in a direction nearly north and south. 6. The end touched with the south pole of the stone will point northwards, and so *vice versâ*. 7. A strong magnet, at the least distance from a lesser or a weaker, cannot draw to it a piece of iron adhering actually to such lesser or weaker stone; but if it comes to touch it, it can draw it from the other: and yet a

* See Vol. I. p. 171.

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weaker magnet, or even a little piece of iron, can draw away another piece contiguous to a greater or stronger load-stone. 8. A plate of iron only, but no other body interposed, can hinder the operation of the magnet, either as to its attractive or directive quality. 9. The virtue of a load-stone may be impaired by lying long in a wrong position, as also by rust, wet, &c. and may be quite destroyed by fire. 10. A piece of iron wire well touched, upon being bent round in a ring, or twisted round a stick, will generally lose its directive virtue, or at least suffer a very sensible diminution of that virtue; but if the whole length of the wire be not bent, so that the two ends be left straight, the virtue will not be destroyed in those parts, though it will in all the rest. 11. A piece of wire that has been touched, being split asunder, the poles are sometimes changed, as in a divided magnet, the north becoming the south, and the south the north; and sometimes one half of the wire will retain its former poles, and those of the other half be changed. 12. By drawing the back of a knife, or a long piece of steel-wire, &c. leisurely over the pole of a magnet, carrying the motion from the middle of the stone to the pole, the knife or wire will accordingly attract one end of the needle; but if the knife or wire be drawn from the same pole to the middle of the stone, it will repel that end of the needle which in the other case it attracts. 13. If either a magnet or a piece of iron be laid on a cork, so as to float freely in the water, it will be found, that whichever of the two is held in the hand, the other will be drawn towards it; so that iron attracts the magnet as much as it is attracted by it. 14. As the magnet communicates its virtue to iron, so when armed r set in iron, it will take up a greater weight of

it than it can alone*. 15. A knife, &c. touched with a magnet, acquires a greater or less degree of virtue, according to the part it is touched on. It receives the strongest touch when it is drawn slowly from the handle towards the point over one of the poles of the magnet; and if the same knife thus touched, and in possession of a strong attractive power, be retouched in a contrary direction, viz. by drawing it from the point towards the handle over the same pole, it immediately loses all its virtue. 16. The magnet acts with the same force in vacuo, as in the open air.

These are the principal phenomena of the magnet; but to account for the manner in which they are produced, we have yet no satisfactory hypothesis. Some of the ancients ascribe the action of the magnet to a soul that animates it, and others to a certain sympathy between the effluvia of iron and those of the magnet. The chief opinion that prevails among the moderns, is that of Des Cartes, maintained by Malebranche, Rohault, &c. and even admitted and confirmed by Mr. Boyle and

* It is likewise observable, that the power or force of magnets is generally greater in small than in large ones, in proportion to their bulk. Those of a larger size will rarely take up more iron than three or four times their own weight; whereas if small ones do not take up more than eight, ten, or twelve times their weight, they are reckoned but indifferent. A gentleman at Bruton in Somersetshire had a magnet, whose weight, with the armature, was but forty-three grains, and yet would take up one thousand and thirty-two grains, which is twenty-four times its weight; and we have heard of another gentleman, who wore one in his ring, that scarcely weighed three grains, and would take up nearly seven hundred and fifty grains, which is two hundred and fifty times its weight. This, however, is an instance hardly to be paralleled.

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other great philosophers. This supposes a subtle, impalpable, and invisible matter, striated or channelled, continually circulating round the earth in the plains of the meridians, re-entering at the pole opposite to that from which it issued, and so passing through the earth in a direction parallel to its axis. The magnet, it is imagined, has two poles answerable to those of the earth, and out of these issues a matter like that just mentioned, which gives the impulse whereby iron tends to the magnet, and produces what we call attraction. Now besides the matter re-entering the poles, there is a quantity of it continually circulating round the magnet, and forming a kind of vortex; and the spaces wherein this matter moves is the sphere of the magnet's activity, within which its attractive faculty is confined. The essence of a magnet therefore is supposed to consist in its being perforated by an infinite number of parallel pores, some of which are disposed to admit the striated matter from the north pole of the world, others that of the south; and hence the north and south poles of the magnet.—Mr. Whiston supposes the directive power of the loadstone to be mechanical, ascribing it to the circulating effluvia, of which he thinks there are evident indications in magnetic experiments; as Mr. Boyle thinks there are of the magnetic effluvia of the earth, though they were never yet rendered sensible: But the attractive power Mr. Whiston imagines to be entirely immechanical, like the power of gravity.

Several ways have been tried, with little success, for recovering the decayed virtue of loadstones; but there is a remarkable experiment of this kind made by Mr. Haac, which answered the purpose so well that it deserves to be mentioned.

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This gentleman had a loadstone which would take up fourteen pounds and a half, but having laid it by for several years, he found it had lost great part of its virtue; which he had endeavoured to recover by several means, but without success. At last he reflected, that by use and exercise the powers of animal bodies were often improved, and it might possibly happen so with respect to some properties or powers of inanimate bodies. Upon this thought, he hung as much weight to the stone as it would sustain, and so left it for the space of some weeks. Then returning, he applied more weight to the former, which it easily bore; and thus by repeating the addition of more weight at several periods, in about two years time the stone had not only recovered its former strength, but increased it so far, that it would take up more than twenty pounds.

There is a sort of stone found in Sweden, which yields sulphur, vitriol, alum, and minium, whereof Sir Gilbert Talbot has given the following account:—It is ponderous, and of a yellow colour, intermixed with streaks of white, as if composed of gold and silver. It runs in veins among the rocks, on which they lay wood, and set it on fire; and when the stone is heated, they throw water upon it to make it rend, and dig it up with mattocks. They afterwards break it into smaller pieces, and melt it in ovens, in iron pots, which are placed sloping, so that the melted matter may run out of one pot into another set to receive it at the mouth of the oven. This running of the stone is sulphur; and the remaining mass is carried out, and laid on a hill, where it is exposed to the sun and air for two years. It then takes fire of itself, yielding a thin blue flame, scarcely discernible in

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the day-time, and leaving a blue dust behind it; which the workmen observing, they dig it up, and put it into great tubs of water to infuse for twenty-four hours. The water is afterwards boiled in kettles, and put into cooling tubs, wherein cross sticks are placed, on which the vitriol fastens, like sugar-candy. What remains of the water, after the extraction of the vitriol, is mixed with an eighth part of urine, and the lees of wood-ashes; which being again boiled very strong, and set to cool in tubs, the sticks placed in them are incrusted with alum. In the water that remains after the alum, is found a sediment, which being separated from the water and burnt in an oven, becomes red, and is the minium wherewith they paint their houses *.

ANIMALS.

THE woods and mountains of Sweden and Lapland abound with wild beasts of various kinds, such as bears, elks, deer, wolves, foxes, &c. most of which are too well known to require a description. The elk, indeed, is a creature which some of our readers may neither have seen nor heard of, and therefore we shall describe it here, though it is not peculiar to Sweden, but is also found in the forests of Muscovy, Poland,

* What we commonly call minium, or red lead, is a preparation of lead, made by melting the metal in an unglazed earthen pan, and stirring it till it be reduced first to a blackish, then yellowish, and lastly to a very red powder, which is of some use in medicine, but of more in painting.

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and other countries. This animal is somewhat larger than the horse, both in bulk and height; but the uncommon length of its head and ears, the shortness of its neck, and the length of its legs, render its form extremely awkward. The hair of the male is white at the roots, cinereous in the middle, and black at the points; that of the female is of a sandy brown, except on the belly, flank, and throat, which are marked with white. The upper lip is square, and deeply furrowed; the nose is broad; and the nostrils are remarkably wide. The horns are broad and palmated, but have no brow antlers: they are shed annually, and it is said, that they have been sometimes found to weigh upwards of sixty pounds.

In every action and attitude, the elk appears a very uncouth animal, and when disturbed it does not run, but only makes off in a kind of trot, which the length of its legs enables it to do with equal swiftness and facility. In their common walk they lift their feet very high, and can step over a gate five feet in height without any difficulty.

These animals generally reside amidst woods or forests, for the conveniency of browsing on the boughs of trees; being prevented from grazing, by the shortness of their necks, and the extraordinary length of their legs. They frequently have recourse to water plants, which they procure by wading: and they are so exceedingly fond of the anagyris fœtida, or stinking bean trefoil, that they will uncover the snow with their feet to get at it. In passing through a forest they always hold their heads in a horizontal position, to prevent their horns from being entangled in the branches.

When suddenly roused, and endeavouring to

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make its escape, the elk is sometimes observed to fall down, as if under a temporary deprivation of motion. Whether this be owing to an epileptic fit, or whether it merely results from fear, is not easy to determine; but the fact is too well authenticated to admit our doubting it. Many persons affirm, that the elk is subject to an epilepsy, and as the animal frequently scratches it head with its hind hoof, it has been whimsically apprehended to be done as a remedy for that distemper. Hence has arisen the popular superstition of attributing to the hoofs of the elk the virtue of an anti-epileptic medicine.

The flesh of the elk is tolerably good; but it is coarse grained, and much tougher than any other kind of venison: the tongue, however, is said to be excellent, and the nose so much like marrow as to be esteemed a peculiar delicacy. The skins, when properly dressed, make excellent tent-covers and shoe-leather, and the hair is used in stuffing mattrasses, saddles, &c. The females have from one to three young at a time, and usually produce them toward the latter end of April, or the beginning of May.

Elks are the easiest to tame and domesticate of any animals of the deer kind: they will follow their keeper to any distance, and return home with him, without ever attempting to deviate from the path.

The rein deer of Lapland are of the utmost service to the inhabitants of that country, and may be properly said to constitute their principal wealth; for the milk affords them cheese; the skin clothing; the tendons, thread and bow-strings; the horns, glue; and the flesh, a nutritive and delicate repast. They also supply the want of horses,

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Singular Mode of Travelling in Lapland.

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and draw the sledges with amazing swiftness over the frozen lakes and rivers, or across the snow, which, during winter, covers the whole face of the country. Thomson, in describing the rude but simple manners of the Laplanders, thus describes the utility of these animals :—

"Their rein-deer form their riches : these their tents,
Their robes, their beds, and all their homely wealth
Supply, their wholesome fare and cheerful cups :
Obsequious at their call, the docile tribe
Yield to the sledge their necks, and whirl them swift
O'er hill and dale, heap'd into one expanse
Of marbled snow, as far as eye can sweep,
With the blue crust of ice unbounded glaz'd."

The rein-deer is about the size of a stag, with large branched horns, bent forwards and palmated at the ends. The colour is brown above and white beneath; but as the creature advances in age, it becomes of a greyish white. The hair on the under part of the neck is much longer than that on the body, and the hoofs are long, thick, and cloven; and, when they walk, their joints make a noise like the dashing of stones against each other. This has been attributed to the animals separating and afterwards bringing together the divisions of their hoofs; which, as they inhabit a country generally covered with snow, is most admirably adapted to the surface they have to tread.

In autumn these quadrupeds seek the highest hills, in order to avoid the Lapland gad-fly, which, at that time, deposits its eggs in their skin, and torments them in the most cruel manner. The moment a single fly appears, the whole herd fling up their heads, toss about their horns, and flee for shelter amidst the snows of the loftiest mountains. During the summer they feed on a

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variety of plants; but their chief food in winter is a species of lichen called rein liverwort, which they dig, with their feet and antlers, from under the snow. Another species of lichen which hangs on the Lapland pines, affords sustenance to the rein-deer when the snow is impenetrably frozen, or too deep to allow them to reach their other food.

The rein-deer shed their horns annually; they also change their hair every spring, during which time they are very lean and of little use. The female begins to breed at the age of two years, goes with young eight months, and generally produces two at a time. Both sexes are furnished with horns, but those of the male are much the largest. The young ones follow their dam about three years, and are soon afterward trained to labour. They continue serviceable four or five years; but seldom outlive the age of sixteen.

With a couple of these animals yoked to a sledge, a Laplander is able to travel a hundred and twelve English miles in a day; and it is said that they can thrice change the horizon in twenty-four hours; or, in other words, they can three times pass that object which, at their setting out, they saw at the greatest distance.

The sledge is made in the form of a small boat, with a back board and a convex bottom; the prow is sharp and pointed, but the sledge is flat behind. The traveller is tied in this carriage like an infant in a cradle; having a stick in his hand, to steer his course and to disengage the sledge from pieces of rock and stumps of trees that may chance to encounter it in the journey. The traces are fastened to a collar about the neck of the rein-deer, going down his breast and between his legs; the reins are tied to the horns, and the trappings are fur-

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nished with little bells, with which the animal appears greatly delighted. With this draught the rein-deer will run fifty English miles without intermission, and without any other refreshment than that of occasionally moistening his mouth with the snow.

The Laplander, previously to his setting out, whispers in the ear of the rein-deer the way he is to go, and the place where he is to halt; being fully persuaded that the creature understands his meaning: he also frequently encourages it by his voice, and usually beguiles the length of his journey with some of those love songs which afford most beautiful specimens of the poetry of this uncivilized but harmless nation. One of these admirable pieces we take the liberty to insert from Mr. Consett's Tour in Lapland.

"The snows are dissolving on Tornao's rude side,
And the ice of Lulhea flows down the dark tide;
Thy dark stream, oh Lulhea, flows freely away,
And the snow-drop unfolds her pale beauties to-day.

Far off the keen terrors of winter retire,
And the north's dancing streamers relinquish their fire;
The sun's genial beams swell the bud on the tree,
And Enna chaunts forth her wild warblings with glee.

The rein-deer, unharness'd, in freedom shall play,
And safely o'er Odon's steep precipice stray;
The wolf to the forest's recesses shall fly,
And howl to the moon as she glides through the sky.

Then haste my fair Luah, oh! haste to the grove,
And pass the sweet season in rapture and love;
In youth let our bosoms with extacy glow,
For the winter of life ne'er a transport can know."

There is a breed betwixt the wild buck rein-deer, and the tame doe, which is of considerable use in long journies, being much taller and stronger than the tame ones: but they retain much of their na-

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tural wildness, and sometimes prove extremely refractory; not only refusing to obey their driver, but turning upon him, and assaulting him so furiously with their feet, that his only resource is to cover himself with his sledge. The tame rein-deer, on the contrary, are remarkably gentle and submissive.—When an opulent Laplander dies, the corpse is drawn in a sledge, by a rein-deer, to the place of burial, after which the animal is killed to make a funeral entertainment for the friends and relations of the deceased.

BUILDINGS.

IN these northern countries we find but few buildings that are so elegant or magnificent as to deserve particular notice. Several of the churches in Stockholm, however, are very large and handsome structures; and that of St. Nicholas is particular magnificent, being supported by marble pillars, covered with copper, and adorned with a great number of tombs of different kinds of marble. The statue of St. George on horseback, killing the dragon, is much admired. This is the fabulous history of his delivering Cleodolinda, the daughter of the king of Lydia, and twelve other virgins, from the fury of the dragon; and that princess is seen kneeling with her hands lifted up. Over the altar is a gilded cabinet, on which is a table of a pyramidal form, with shelves of massy silver, adorned with basso relievos representing the nativity of Christ, his last supper, his crucifixion, his burial, and his resurrection. These are all of silver; and on the top is a statue, about two feet high, of the same metal, representing the ascension.

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About the altar are other silver statues of the same height, as that of Moses, with the two tables of the law; John the Baptist; and the evangelists, with the animals usually assigned them, by painters and statuaries; all of them weighing together about thirty thousand ounces. On the right side of the altar is a large picture of heaven and hell, which reaches from the roof to the floor; and on the left side, is painted the crucifixion.

The cathedral of Upsal is accounted one of the finest churches in the kingdom; it has been five times destroyed by fire; the last time was in 1702; but it has since been rebuilt with great magnificence, and is adorned with stately monuments of some of the kings of Sweden.

The cathedral of Lunden is a magnificent structure, and has a very lofty spire, which serves as a mark for sailors, being seen at a great distance.

The altar of this church is a beautiful piece of work; but what most engages the attention of a stranger is its curious clock, which, for the number of its movements and figures, may vie with those of Lyons and Strasburg. Every hour two horsemen come out and encounter, and a door opens, which discovers the virgin Mary sitting on a throne with her divine infant in her arms, and the Magi with their retinue marching in order, and presenting their gifts, two trumpeters sounding all the time of the procession. This clock, besides the hour, shows the month and day, and every festival throughout the year: but, however ingenious the mechanism of these celebrated clocks may be, we are inclined to think, that pieces of clock-work equally curious and wonderful, have lately been made in England.

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CHAP. XI.

OF POLAND.

Minerals, Fossils, &c.

THE soil of this country is generally fertile, fit for tillage and pasture, so that it produces abundance of corn, and feeds vast numbers of cattle. It is rather flat than mountainous, except on the side of Hungary, from which it is separated by a long chain of craggy hills, called the Carpathian mountains. Some of its mountains afford mines of silver, copper, lead, and iron; but the most considerable of all are the salt mines in the Lesser Poland, which are wonderful caverns, several hundred yards deep, at the bottom of which are many intricate windings and labyrinths. Out of these are dug four different kinds of salt; one extremely hard, like crystal; another, softer and clearer; a third, white, but brittle; these are all brackish; but the fourth is somewhat fresher. These four kinds are dug in different mines near the city of Cracow; on one side of them is a stream of salt water; and on the other, one of fresh. The revenue arising from these and other salt mines, is very considerable, and formed part of the royal revenue, till they were seized by the emperor, being situated within the provinces which he dismembered from Poland; the annual average profit of that of Wielitska, 3,500,000 Polish florins, or 97,222*l.* 4*s.* 6*d.* sterling.—The latter, indeed, is the most considerable salt-

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mine in the world, and from hence a great part of the continent is supplied with that article.

At Wielitska, a small town, about eight miles from Cracow, the mine is excavated in a ridge of hills at the northern extremity of the chain which joins to the Carpathian mountains, and has been wrought above six hundred years; for they are mentioned in the Polish Annals, so early as 1237, under Boleslaus the Chaste, and not then as a new discovery; though how much earlier they were known cannot be ascertained. There are eight openings or descents into this mine, six in the field, and two in the town itself, which are chiefly used for letting down the workmen, and taking up the salt; the others being used for taking in wood and other necessaries. The openings are five feet square, and about four wide; they are lined throughout with timber, and at the top of each there is a large wheel, with a rope as thick as a cable, by which things are let down and drawn up; and this is worked by a horse.

When a stranger wishes to gratify his curiosity by seeing the works, he must descend by one of these holes: he is first to put on a miner's coat over his clothes, and then being led to the mouth of the hole by a miner, who acts as a guide, the miner fastens a smaller rope to the larger one, and ties it about himself; he sits in this, and, taking the stranger in his lap, gives the sign to be let down. When several persons go down together, the custom is, that when the first is let down about three yards, the wheel stops, and another miner takes another rope, ties himself, takes another in his lap, and descends about three yards further; the wheel then stops for another pair, and so on till the whole company are seated;

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then the wheel is again worked, and all the adventurers are lowered down together. It is no uncommon thing for forty people to go down in this manner. When the wheel is finally set a-going, it never stops till they are all down; but the descent is very slow and gradual, and it is a very uncomfortable time, while they all recollect that their lives depend entirely upon the strength of the rope. They are carried down a narrow and dark well to the depth of six hundred feet perpendicular; this is in reality an immense depth, but the terror and tediousness of the descent, makes it appear to most people, vastly more than it is. As soon as the first miner touches the ground at the bottom, he slips out of the rope and sets his companion upon his legs, and the rope continues descending till all the rest do the same.

The place where they are set down is perfectly dark; but the miners strike fire, and light a small lamp, by means of which, (each taking the stranger he has care of, by the arm) they lead them through a number of passages and meanders, all descending lower and lower, till they come to certain ladders, by which they descend an immense depth, and this through passages perfectly dark. The damp, cold, and darkness of these places, and the horror of being so many yards under ground, generally make strangers repent before they get thus far; but when at the bottom, they are well rewarded for their pains, by a sight that could never have been expected after so much horror.

At the foot of the last ladder, the stranger is received in a small dark cavern, walled up perfectly close on all sides. To increase the terror of the scene, it is usual for the guide to pretend

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the utmost terror on the apprehension of his lam going out, declaring that such an accident mu be attended with the most fatal consequence When arrived in this dreary chamber, he puts o his light, as if by accident; but, after some tim catches the stranger by the hand, and drags hi through a narrow creek into the body of the min when there bursts at once upon his view a litt world, the lustre of which is scarcely to be im gined. It is a spacious plain, containing a who people, a kind of subterranean republic, wi houses, carriages, roads, &c. This is scoope out of one vast bed of salt, which is all a hard roc as bright and glittering as crystal; and the who space before him is formed of lofty arched vault supported by columns of salt, and roofed an floored with the same, so that the columns, an indeed the whole fabric, seem composed of th purest crystal. There are several lights in th place continually burning, for the general use and the blaze of those reflected from every part the mine, gives a more glittering prospect tha any thing above ground can possibly exhibit.

Were this the whole beauty of the spot, it wer sufficient to excite astonishment and admiration but this is only a small part. The salt (thoug generally clear and bright as crystal,) is, in som places, tinged with all the colours of preciou stones, as blue, yellow, purple, and green; ther are numerous columns wholly composed of thes kinds, and they look like masses of rubies, eme ralds, amethysts, and sapphires, darting a rad ance which the eye can hardly bear, and whic has given many people occasion to compare it t the supposed magnificence of heaven.—Beside the variety of forms in those vaults, tables, arche

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and columns which are framed as they dig out the salt for the purpose of keeping up the roof, there is a vast variety of others, grotesqued and finely figured, the work of nature; and these are generally of the purest and brightest salts. The roofs of the arches are in many places adorned with salt, hanging from the top in form of icicles, and having all the hues and colours of the rainbow; the walks are covered with various congelations of the same kind; and the very floors, when not too much trodden and battered, are covered with globules of the same sort of materials.

In various parts of this spacious plain stand the huts of the miners and families, some single, and others in clusters like villages. They have very little communication with the world above ground, and many hundreds of people are born and live all their lives here. Through the midst of this plain, lies a road, which is always filled with carriages loaded with masses of salt out of the farther part of the mine, and carrying them to the place where the rope belonging to the wheel receives them; the drivers of these carriages are all merry and singing, and the salt looks like a load of gems. A great number of horses are kept here, and when once let down, they never see day-light again; but some of the men take frequent occasions of going up and breathing the fresh air.

The instruments principally used by the miners are pick-axes, hammers, and chissels; with which they dig out the salt in forms of huge cylinders, each of many hundred weight. This is found the most convenient method of getting them out of the mine, and as soon as got above ground, they are broken into smaller pieces, and sent to

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the mills, where they are reduced to powder. The finest sort of salt is frequently cut into toys, and often passes for real crystal. This hard kind makes a great part of the floor of the mine; and what is the most surprising in the whole place is, that there runs constantly through a large part of the mine a spring of fresh water, sufficient to supply the inhabitants and their horses, so that they have no need of any from above ground. The horses usually grow blind after they have been some little time in the mine; but they do as well for service afterwards as before.

The salt dug from this mine is called ziebna, or green salt, but for what reason it is difficult to determine, its colour being an iron grey; when pounded, it has a dirty ash colour, like what we call brown salt. The mine appears to be inexhaustible, as will easily be conceived, from the following account of its dimensions, given by Mr. Coxe:—"Its known breadth (says he) is one thousand one hundred and fifteen feet, its length six thousand six hundred and ninety-one feet, and its depth seven hundred and forty-three:" this, however, is to be understood only of the part which has been actually worked; as to the real depth or longitudinal extent of the mine, it is not possible to conjecture.

In some parts of Poland is found the beautiful transparent substance called amber, concerning whose nature and origin there has been a vast diversity of opinions, some referring it to the mineral, others to the vegetable, and others to the animal kingdom *. There is, however, little

* Amber is found in several parts of Europe, but no where in such abundance as in Prussia, where it is both dug out of the earth, and fished out of the Baltic sea. The

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doubt to be made, but that it is wholly of mineral origin, and is a bitumen once liquid, much like naphtha or petroleum, hardened and brought into its present state by a mineral acid of the nature of the spirit of sulphur, or oil of vitriol, both these substances abounding in the earth, and an artificial mixture of them producing a body similar to the native amber. This fossil is of a fine, uniform, and regular texture, very light, yet heavy enough to sink in water, is naturally of a rough surface, yields a fragrant smell when rubbed, and is endued with the property of attracting light bodies, which from its name (Electrum,) is called electricity. It is found in various shapes and sizes, but its most usual standard is between half an inch and three inches in diameter. Its natural colour is a beautiful pale yellow; but it is sometimes altered by heterogeneous mixtures of metalline or earthy particles, received into it while not yet perfectly hardened. Hence it is sometimes white, sometimes brown, and sometimes even black and opake, in which last state it is preferable to the finest jet, though some say there is no such thing as black amber; and

coasts of Pomerania, Samogitia, Courland, and Livonia, afford it in considerable quantities; and it has been often dug up in Denmark. It is met with in some parts of France and Italy, nor is our own country without it; for Dr. Woodward mentions several places where it is found in England; and Mr. Hill tells us he has picked up some fine and beautiful pieces on the Yorkshire coast. The neighbourhood of London also affords some that is tolerably fine, as the last mentioned gentleman observes, who wore in the head of his cane, a piece of amber near three inches long, which he found in the great tile-clay pit, behind St. George's Hospital at Hyde-Park Corner.

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sometimes, but rarely, it is found tinged with a reddish or greenish cast, and yet as pellucid as the common amber. It is very hard, breaks with a smooth surface, and even in the largest pieces is very transparent.

In Polish Prussia, where vast quantities of amber are dug out of the earth; it lies usually below five strata in the following order. The uppermost is a coarse yellow sand; the second a whitish clay; the third, a substance resembling wood, but made up of several flakes lying one over another; the fourth a stratum of pyrites, or a kind of vitriolic ore, and the fifth another of yellow sand, amongst which the amber lies, and is extracted with convenient instruments. Besides this, there is plenty of amber found in the Baltic sea, which the country people take up with nets, and this is called fished or draught amber; what is gathered on the shore from among the weeds and sand being distinguished by the name of picked amber, and what is dug out of the earth by that of fossil amber. These, however, are not three distinct species, but undoubtedly formed in the same manner; that found in the sea, or thrown upon the shore, being probably carried thither by the rivers or washed by the waves in tempestuous weather, from amongs the rocks, and those subterraneous places where amber is produced and nourished.

Nature seems to have been very curious in the formation of amber, the lumps of it being frequently shaped like pears, almonds, pease, &c.; but what is most wonderful and difficult to account for, are the several animals, leaves, &c. which are sometimes found buried in this fossil. M. Hartman, who has written a history of the Prussian amber, enumerates above thirty species of in-

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sects inclosed in pieces he was possessed of, as flies, spiders, ants, beetles, &c. and some authors mention frogs, lizards, and small fishes, inclosed in amber, but the truth of this may be suspected.

How these animals come to be immersed in amber is a question much agitated amongst the curious enquirers into the works of nature. Some have endeavoured to account for it by supposing amber to have been of vegetable origin, as if animals could more easily be entangled in the resinous and gummy juices of trees; but this is not supported by experience; for insects are seldom or never found enclosed in such juices, but only adhering externally to their surface. Others again have denied them to be real insects, but any one may be satisfied of the contrary, by viewing such a piece of amber when cut or broken, for evident traces of the little animals still remain.

Insects thus found in amber are indeed an unquestionable proof of its having been once in a liquid state, and the better to understand how they came to be inclosed in it, we need only reflect that it is usual for them in rigorous seasons to seek for shelter and sleep in caverns, where they are covered and buried in the bituminous matter, which afterwards hardens into amber. And on this occasion we are to consider, that all the pieces of amber which contain flies, and other insects, are of that kind which is picked up on the sea-shore; very few accounts that can be depended upon having yet been given of any dug out of the earth with such animals inclosed. Now as the native liquid bitumens are continually trickling down the outsides of rocks and hills, and as some of this matter may be lodged in small cavities, or otherwise detained on the surface of the earth,

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where it may gradually be changed into amber, it is not much to be wondered at, if flies, and such like insects, are sometimes inclosed and bedded in a fossil formed after that manner.

The people who live on the Prussian coast, and in other places where amber is produced, observe, that ravens, crows, asses, sheep, and several other animals are extremely fond of it; and that pieces of it are frequently found in their excrements, and in their bodies when opened. It is in considerable repute for its medicinal virtues, being used in fumigations to remove defluxions, and its fumes received at the mouth are often successful in the beginning of a quinsey. In the time of the plague those who work in amber at Koningsberg are said never to be infected; whence it is looked upon as a preservative against contagion.

The electricity of amber, or its power of attracting straws, paper, and other light bodies, is certainly very surprising; but the same property is also found in jet, glass, sealing-wax, most kinds of precious stones, and in all resinous and bituminous substances *. This species of attraction differs from magnetism in this, that the latter only attracts iron or steel, whereas electricity attracts most sorts of bodies indifferently, though the effect be only sensible in light ones. From the experiments made by several philosophers to de-

* Some distinguish electricity into two kinds, namely, vitreous electricity, or that which belongs to glass; and resinous electricity, or that which belongs to amber, rosin, wax, gums, and such-like substances. That they are different kinds seems evident from their contrary effects; for the light bodies repelled by one will be attracted by the other, which cannot happen when both bodies have the same attractive power.

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termine the nature and laws of electricity, it appears, 1. That electrical bodies do not attract at all, or very rarely, except they be warmed by attrition, and thereby disposed to emit their effluvia more copiously. 2. These bodies when warmed by fire, do not attract so forcibly as when heated by rubbing; but if they be first warmed by fire, and then rubbed, they attract the more strongly. 3. The interposition of fine linen, muslin, &c. will totally hinder the operation of electrical bodies, though the virtue penetrates the pores of glass. 4. The sphere or extent of this attracting power varies with the state of the weather, the attraction being stronger in hot and dry weather than it is in cold and moist. 5. This virtue may be communicated to the distance of seven or eight hundred yards by the intervention of a proper body, as hempen strings, &c. Electrical bodies sometimes alternately attract and repel others to a considerable distance, and with great velocity; but in some cases the body once repelled will not be again attracted till it has first touched some other body. 7. If the sphere of attraction be interrupted in any part, it destroys the efficacy of the whole. 8. This virtue will exert itself in vacuo, but not so strongly as in the open air. 9. It may be excited to such a degree as to appear lucid, and sparkle like fire in a dark room. 10. It may be plainly felt on the face or finger, striking against it like a puff of wind; and is sensible to the ear by a crackling noise, like that of burning charcoal.

Mr. Martin observes, that the uses of this wondrous virtue of electricity have not yet been discovered; but Mr. Gray, a little before his death, hit upon an experiment which seemed to indicate, that the attractive power which regulates the mo-

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tions of the heavenly bodies, is of the electric kind. The experiment was this: He fixed a large iron ball upon a cake of rosin and wax, and exciting the virtue strongly in the cake, a fine feather suspended by a thread, and held near the iron ball, was carried round it by the effluvia in a circular manner, and performed several revolutions. It moved from west to east, as the planets do; and its motions, like theirs, was not quite circular, but a little eliptical.

ANIMALS.

THE woods and forests of Poland abound with hares, deer, foxes, bears, wolves, and boars; and they have also plenty of elks, wild asses, wild bulls, and buffaloes, whose flesh the Poles reckon a great dainty. In the Ukrain are likewise some wild horses, whose flesh is equally esteemed. The wolf resembling a hart, or the European lynx, called by the natives Ris, with spots on its belly and legs, yields the best fur of any animal in Poland, though there are several others which are hunted and killed for the sake of their skins only. In Podolia there is a sort of quails that have green legs; but their flesh is reckoned unwholesome, and said to give people the cramp if too frequently or immoderately eaten.

The method of hunting and taking the wild bulls is as follows: A great number of horsemen surround the bull, one of whom rides up and throws a dart at him, upon which the enraged animal pursues his enemy, but being wounded by another behind, he faces about to pursue the latter;

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and thus by turns they so harass him, that being quite tired with defending himself against so many assailants, he at length falls down, and is easily taken.

Another method of taking these beasts is by felling several trees, and thereby inclosing them so that they cannot easily escape. When a bull is thus surrounded, each hunter, having his proper post, throws darts at him, and whilst the bull runs towards one of them, another from behind gives him a mortal wound. If he chance to break through the inclosure and any of the hunters are in danger, the man he runs at, holds out a piece of red cloth, against which the beast having an antipathy, he immediately leaves that person, and makes towards another, who commonly kills or disables him.

Bears, and those of the largest size, are frequently taken in Poland with nets; in which one of them being entangled, the sportsmen ride up to him, pin down his head and feet with great wooden forks, and bind him so fast with strong cords that he is not able to stir, but the knots are so contrived that with one pull they may be untied. Having thus secured the bear, they put him into a great wooden chest, where they keep him, and turn him loose when they wish to take the diversion of hunting.

Poland contains many beautiful species of birds; but that which has been most particularly noticed by curious and intelligent travellers, is the remiz, or penduline titmouse. This bird is about four inches and a half in length. The head is of a pale bluish ash colour, the fore part of the neck and breast tinged with red; the belly white; wings black; back and rump of a yellowish rust colour,

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and the quill feathers cinereous, edged with white. The male is particularly distinguished from the female, by a pair of black-pointed whiskers.

The most curious particular, however, in the history of these birds is the astonishing art which they display in the construction of their nests. Having collected a quantity of light down from the buds of willows, aspens, poplars, thistles, &c. they entwine it carefully with their bill, and form a thick close web, almost similar to cloth: this they fortify externally with small roots and fibres; and line the inside with down alone, that their little progeny may lie soft. They then close the nest above to confine the warmth, and suspend it, with hemp, nettles, &c. from a small pliant branch, over a river, or lake of water. The nest, when completed, resembles a short purse or bag, with a circular hole in the side, about an inch and a half in diameter, and surrounded with a protuberant rim.

Mr. Coxe observes, that this bird, contrary to the custom of other titmice, lays only four or five eggs: but he adds, that Providence has probably ordained this scantiness of eggs to the remiz, because, by the singular instinct imparted to it, it is enabled to secure its young more effectually from destruction, than the other species, which are very prolific.

BUILDINGS.

MOST travellers inform us, that many of the churches and other public structures in Poland are very beautiful and magnificent, but in the de-

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scriptions of them they are not so particular as might be expected. In Warsaw, the capital of the kingdom, the principal church, dedicated to St. John the Baptist, is a noble fabric and richly adorned; besides which there are several others worthy observation. The palace in that city, where the kings of Poland formerly resided, and the general diet of the kingdom assembled, is a large square pile of buildings, begun by Sigismund III. and enlarged and beautified by his successors. Another beautiful palace is situated in the suburbs, amidst delightful groves and gardens; and not far from it there is a small chapel erected in memory of a victory gained over the Muscovites, in which there is a fine sepulchral monument of Demetrius Suiseius great duke of Muscovy, who being taken prisoner, died a captive in Poland.

In the city of Cracow are several magnificent structures, and particularly the castle, which is a mile in compass, wherein is a noble palace built of stone, having a square court within it, and galleries running round the outside supported by marble pillars. The grand apartments are adorned with fine paintings and statues, and the north gallery commands a most charming prospect of the neighbouring country. Within this castle stands the cathedral dedicated to St. Stanislaus, a majestic structure, wherein the kings of Poland were crowned and usually interred, and where are preserved the relics of the ancient bishop and patron of the nation, who was murdered in this church in the eleventh century by Boleslaus the Bold. Several kings have offered vessels of gold and silver at his tomb; Sigismund I. built a silver altar over it; and to the priests who were

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appointed to serve at it, he gave many rich vestments embroidered with jewels.

About an English mile from Cracow, are some remains of an old edifice, called the palace of Casimir the Great, though it is probable that little of the original palace as it was built by Casimir, exists at present. In the inner court are the remains of a corridore with pillars of the Doric order; upon one of the side walls is the white eagle of Poland carved in stone, and around it is an inscription in old Gothic characters. Mr. Coxe is of opinion that the greatest part of the fabric is of later date than the reign of Casimir, and he thinks it probable that it may have been constructed upon the foundation of the ancient palace, by Stephen Bathori and Sigismund III. as here is in one place an inscription, *Stephanus Dei gratia*; and in another is Sigismund's cypher, with the arms of Gustavus Vasa, from whom he was lineally descended.

The cathedral of Gnesna, formerly the metropolis of the kingdom, and now the see of an archbishop who is primate of Poland, is a fine ancient fabric, and is remarkable for its gates of Corinthian brass exquisitely wrought, which formerly belonged to a Greek monastery in the Morea, and were brought from thence by Boleslaus the Second. In this church is a vast treasure of gold, silver, and curious enamelled vessels, given by several kings and archbishops. The tomb of one of its prelates, viz. St. Adelbert, was cased with silver by Sigismund III.; and archbishop Firley added to its treasure many costly vessels and vestments, particularly his own mitre, which has been valued at two thousand pounds sterling.

The city of Posnania or Posnan, which lies

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west from Gnesna, has also a stately cathedral, richly adorned, where they show the tomb of duke Mieceslaus, who introduced christianity into Poland. It has likewise several other handsome churches, and a large town-house of excellent architecture; but no building of that kind in the kingdom is equal to the town-house of Thorn, which is reckoned one of the finest in Europe.

We shall conclude with Dantzick, the capital of Polish Prussia, and a city of very great trade, which is adorned with many noble structures, particularly St. Mary's church, which is remarkably grand and beautiful. It has several thousand windows, forty-eight altars, and a font, made at Antwerp, which cost about five thousand pounds sterling. The town-house is also magnificent, and has a lofty spire; but this and other fine buildings were much damaged by the bombs and red-hot balls of the Russians, when they besieged Dantzick under count Munich in 1734, in order to drive out king Stanislaus and his adherents, who had taken shelter in that city.

MISCELLANEOUS CURIOSITIES.

UNDER the mountains adjoining to Kiow, in the deserts of Podolia, are several grottos, where a number of human bodies are preserved, and, though buried many ages ago, are neither so hard nor so black as Egyptian mummies. Among them are two princes, in the habits they used to wear. It is supposed that this preserving quality is owing to the nature of the soil, which is remarkable dry and sandy.

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In the university of Cracow, is a Turkish book, which, though of no intrinsic value, is generally shown to strangers as a curiosity; because it was found among the spoils at the battle of Chotzim, and presented to the university by John Sobieski; as the memorial of a victory which saved his country from devastation, and seated him on the throne of Poland.

Human beings have been sometimes found in the woods of Poland, divested of almost all the properties of humanity except the form; when taken, they generally went on their hands and knees; but by proper management they have been reclaimed from this wild state, and some of them have even attained the use of speech. To account for this surprising fact, some authors have supposed that the frequent incursions of the Tartars and other barbarous nations forced some of the Polish women to leave their children exposed in the woods, where they might possibly be nurtured by bears or other animals.

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CHAP. XII.

OF MUSCOVY, OR THE RUSSIAN EMPIRE.

THIS vast empire, which lies partly in Europe, and partly in Asia, is of an amazing extent, being bounded on the north by the Frozen Ocean; on the east by what is generally called the northern part of the Pacific Ocean; and towards the west and south its limits are settled by treaties concluded with several distant powers, with Sweden, the Turks, the Persians, and the Chinese; by whose dominions this immense empire is bounded, and is of far greater extent than all the rest of Europe. Its length from the dominions of Sweden to its most eastern limits, contains near a hundred and seventy degrees; so that when it is noon-day in the west, it is near mid-night in the eastern part of this empire. In breadth it stretches from north to south eight hundred leagues. Hence both the soil and temperature of the air must be extremely various in different parts. In those which lie beyond the sixtieth degree of latitude, there are few places where corn will ripen; but in the middle of the empire, the soil produces most kind of trees and garden fruits, corn, and all the necessaries of life; and in the southern provinces, where the climate is hot, though there are some barren wastes, yet in many places, wine and silk might be produced in great plenty.

This immense empire is divided into Russia and Siberia, the former in Europe, and the latter in Asia, but both united; and both also thinly peopled. We shall begin with Russia. The

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boundaries of this part of the empire, are the sar with the limits between Europe and Asia, exten ing on the east to the Wercoturian mountai and to part of the Wolga, which separate it fro Siberia; on the south it is bounded by the riv Don, and a line drawn from the Nieper to t mouth of the Don, at its entrance into the sea Esoph; on the west by the Nieper, which sep rates it from Poland, the gulf of Riga, the g of Finland, Sweden, and Swedish Lapland; a on the north by the Frozen Ocean. Its princip river is the Wolga, which is one of the largest the world, running a course of above two tho sand miles before it falls into the Caspian sea. T largest lake in this part of the Russian empire that of Ladoga, being a hundred and fifty mil in length, and ninety in breadth.

Siberia, which lies to the east of Russia, is abo two thousand miles in length, from east to we and about seven hundred and fifty miles in breadt from north to south; but is in most parts extrem ly cold and barren, and every where thinly pe pled. The face of the country, especially towar the north, is as disagreeable as can be imagine being covered with large, and almost inpenetr ble woods, with high and frozen mountains, c vered with everlasting snow, and with fens, lake and marshes. The climate is, however, mo moderate in the southern part, and where t lands do not rise a considerable height abo the level of the sea. Siberia has many anim unknown in Europe; and many different natior that have different manners, customs, language and religions. It is chiefly inhabited by peop of Tartarian race, intermixed with some coloni of Russians, and the descendants of such sta

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prisoners, and others, as have been banished thither. But what is very extraordinary, more perfect accounts have been given of Kamtschatka, a great peninsula, which forms its boundary on the north-east, than of those countries that are seated in the very heart of Siberia.

LAKES, SPRINGS, MOUNTAINS, &c.

THE Baikal in Siberia is a large lake, lying between 52 and 55 degrees of north latitude, and computed to be five hundred wersts in length, but only twenty broad, and in some places not above fifteen. It is environed on all sides by high mountains; and in one part of it, which lies near the river Bargufin, it throws up an inflammable sulphureous liquid called *maltha*, which the neighbouring peasants burn in their lamps. Its water at a distance appears of a sea green colour, but is perfectly fresh, and so clear that objects may be plainly seen at the depth of several fathoms. This lake is called by the neigbouring rustics *Swiatoie more*, or the *Holy Lake*, and they imagine, that when storms happen on it, they will be preserved from all danger by complimenting it with the title of *Sen*. When it is frozen over, people travel upon it in the road to China, but they must be very sharp shod, in order to tread safely on the ice, which is exceedingly smooth. Notwithstanding the ice is sometimes two ells thick, there are some open places in it, to which tempestuous winds will often drive the unfortunate passengers, who in that case must inevitably perish. This lake contains several several small islands, and the borders are frequented by sables and civet cats.

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The Altin is another famous lake in Siberia, from whence issues the river Oby in 52 degrees north latitude, and 85 degrees 55 minutes east longitude. By the Kalmuck Tartars it is called *Altinnor*: but the Russians have given it the name of *Teloskoi Osero*, from the Telessi, a Tartarian nation, who inhabit its borders. It is said to be ninety miles long and fifty broad, with a rocky bottom; though some geographers assert, that it is only eighteen miles long and about twelve miles broad. These different calculations, however, may be accounted for by considering, that the water of this lake, as well as of the rivers which run in through the adjacent places, only rises in the middle of summer, when the snows on the mountains are melted by the sun.

About ten miles from Nikuschkina is a remarkable sulphur lake, situated between two high mountains. It is an oblong bason, overgrown with birches, about four hundred and twenty feet long and three hundred and forty broad. Its aspect is frightful, and its abominable stench may be smelt at the distance of three miles. It has no perceptible motion, and never freezes. A visible thick vapour rises from its surface; yet the water is so clear that one might discern its depth, if it were not for the black and greasy soil which forms its border. Some attempts have been made to discover the origin of the sulphur; but these have all proved fruitless.

From the top of the neighbouring mountain issues a sulphureous spring, which runs down into the lake, and deposes a sediment resembling a white and thick pulp. The continuation of this stream forms the remarkable river called the White-water river which, as it proceeds from the lake, is about

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six feet deep and between fourteen and twenty eight feet broad. In this channel the water has the appearance of thin curds, but in some places the surface has a fine scum like that seen upon limy waters; and all the matter which the water deposes is evidently mixed with limy particles.—Professor Pallas informs us, that the cattle seem occasionally to have recourse to these springs, as conducive to their health; but, as they taint the water of the adjoining rivers, no fish will live in them.

Upon one of the Inderskoi mountains, about a hundred and thirty miles south from Jaizkoi Gorodok is a large lake, which may be justly classed among the wonders of nature. Dr. Pallas observes, that it is apparently about ten miles in circumference, has many bays, and resembles an extensive plain glittering with snow and encompassed with heights which seem to be above the level of the river Jaik. The water is so saturated with salt, that large cubic grains are constantly forming upon the shore, when not prevented by wet weather, and its borders seem to be literally sowed with salt. Indeed, from the constant evaporation of the lake, the surrounding earth is covered with a crust of salt, which is of a pure white, and, when broken, exhibits an extraordinary crystallization in irregular bodies; and underneath this crust lies a loose grey salt, which the Cossacks gather in little waggons, and wash with salt water on the spot, till it loses its grey colour.—The white cubic salt, which the Cossacks call *Tamosa Kaja Sol*, resembles large and small hail, promiscuously scattered on the muddy shore, and touching the ground only in one point; the whiteness of these little cubes is perfectly dazzling, and

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their substance is said to be a sort of alabaster-stone, the parts of which are so minute as to be almost invisible with a magnifying glass.—They are supposed to be formed by some attractive power from the saline particles evaporated from the lake.

On the borders of the river Sok, and in the vicinity of Semenowo, is an asphaltos spring, on the steep declivity of a mountain, overrun with birch trees, whose soil is a fat and black earth. This spring forms a reservoir about three feet wide, which is not only constantly full without any agitation, but also flows over, and forms a little brook. The water never freezes, even in the most rigorous season; and when it is covered with snow, the bituminous vapours soon make an opening, though the water possesses no extraordinary degree of warmth. The surface of this well is covered with a black and tough asphaltos, which has the appearance and consistency of thick tar, and as often as it is taken off, will gather again in a few days. The neighbouring peasants use this bituminous water as a remedy for all infections and ulcerous complaints of the mouth and throat: they also gather the asphaltos, and use it both externally and internally with good success.

On the banks of the river Jurjusen, in the district of the Mursalarskian Baskirians, is a steep woody mountain; but on three of the highest parts are several bare, reddish spots, which are constantly burning. On the eastern side, which is now the burning side, this mountain seems to be about a hundred fathoms in perpendicular height. It has burnt on this side only for the last three years, and that with less violence than in the middle height, the whole southern side being burnt out, for the subterraneous fires have existed

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almost twelve years. A Baskirian gave Dr. Pallas the following account of this singular phenomenon. "About eleven or twelve years ago, a tall pine tree, that stood at the bottom of the middle part of the mountain, was fired by lightning, which consumed the very roots of the tree, and gradually penetrated the body of the mountain." Since that time it has burnt inwardly without any interruption; but in such a manner that the fire has ceased at the bottom, and yet is far from having reached the top. The trees and bushes which formerly covered the southern side, were all consumed to a considerable extent, and the fire, also communicated to an adjacent spot on the western side, but that is now extinguished, and the place is overgrown with a variety of plants.

The stone of which this mountain consists, especially in these spots which are burnt out, is partly a reddish slate, and partly a soft stone divided into thin layers, between which there seems to have been some other matter, now reduced to ashes. In many places is found a yellow ochre iron-stone; and at the bottom of the eastern part is a great quantity of red friable marble. The burning spots are full of large clefts, whence rises continually a hot vapour which no one can bear to approach. During stormy and gloomy nights, red thin flames rise to a considerable height, but there is no sulphureous smell; the exhalation communicating no other sensation than a suffocating heat like that which issues from a hot glowing oven after the embers have been cleared out. The Baskirians affirm, that no snow ever lies on this mountain, that the soil is always clothed with verdure, and that many of the plants which grow upon it may be seen in flower through the whole winter.

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MINERALS, FOSSILS, &c.

SEVERAL parts of this great empire are well furnished with mines of iron, and particularly at Alonitz, near the lake Ladoga, they dig vast quantities of ore, which yields iron of such a temper, that it may be brought to be as durable as brass. The mines of Siberia likewise afford great plenty of excellent iron; and some mines of silver, have lately been discovered in that country, from whence the Russians draw a very considerable treasure. They have also abundance of sulphur and salt-petre, with which they make their own gun-powder, and in time may probably export large quantities of it, having more than sufficient for their own use; and perhaps they may shortly be in a capacity to furnish foreigners with fire-arms; as labour is cheap, and they have plenty of iron.

We have already had occasion to notice a species of talc, commonly known amongst us by the name of Muscovy-Glass, it being brought to us from that country, where it is found in great abundance*. It is a beautiful fossil, of an equal, regular, and elegantly laminated structure; and is usually found in masses ten or twelve inches in breadth, and from half an inch to three inches in thickness. These are of a smooth and even sur-

* This fossil is found in many parts of the world besides Russia, particularly in the island of Cyprus, where it lies in great quantities about four or five feet under the surface, almost throughout the whole island. We have it also from Africa and Arabia, and it has been discovered to abound in the Alps, the Appennines, and many of the mountains of Germany.

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face, except at the edges, where the joinings of various and innumerable flakes make a multitude of thin ridges: which being separated by getting the edge of a knife between them, or other means, the mass readily splits into very thin laminæ, of an extraordinary brightness and transparency. Its colour is of a fine clear white, resembling that of the purest glass; but there is another still more elegant species of this fossil, called red talc, found in Muscovy and Persia, which, though reddish in the masses, is seldom brought to us except in such thin plates as to have no remains of its colour distinguishable. The ancients made windows of this pellucid stone, and at present it is used by miniature painters to cover their pictures. The best sort of lanterns are also made of it instead of horn, and minute objects are usually laid between two plates of it for examination by the microscope.

The large teeth and bones dug up in Siberia, (commonly called Mammoth's bones) may be numbered among the greatest curiosities of this country, and have employed the thoughts and pens of several learned men, who make no doubt of their being the teeth and bones of elephants; and in reality these teeth, or tusks, if not too much corrupted by lying in the ground, are sold and used as ivory all over Russia.

In the British Museum is a tusk found under ground in Siberia, which is of a brownish colour, and hollow at the bottom like other elephants teeth, one of which it plainly appears to be. From the basis, measuring along the outer circumference to the small end, it is five feet seven inches long, and the inner circumference is four feet ten inches. Measuring from the inside of the basis, to the small

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end in a straight line, the distance is three feet ten inches and a half; and at the basis, where thickest, it is eighteen inches round, and six in diameter. This tusk weighs forty-two pounds: but we have credible accounts of some that have been three or four times that weight, and even of some grinders, weighing twenty or twenty-four pounds a piece*.

Ludolphus, in the appendix to his Russian grammar, mentions these teeth and bones among the fossils of Russia; and says, that the natives believe them to belong to an animal living under ground, much larger than any that live upon the surface of the earth. He adds, however, that the more sensible among the Russians affirm them to be elephants teeth, brought thither at the time of the deluge; and he himself, upon examining a piece given him by one of his friends, found it to be real ivory.

The account of these teeth given by Mr. Isbrand Ides, in his travels from Moscow to China, is very particular, the substance of which is as follows. "Amongst the hills," says he, "which are situated to the north-east of Makofskoi, the Mammoth's teeth and legs are found, and more especially on the banks of the Jeniscea, Lena, and other rivers, quite to the Frozen Sea. In the spring, when the ice of these rivers breaks, it is driven with such violence, as to undermine the banks, and occasion part of the adjacent hills

* Here it is to be noted, that such teeth and bones are likewise found in several other countries besides Siberia; as Poland, Germany, Italy, England, Ireland, &c. but less commonly than in Siberia, and not so well preserved, being more wasted and calcined by the greater warmth of those climates.

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to fall down; and thus they discover the teeth of these animals"

A person, who used to go annually in search of these bones, accompanied our author to China, and told him, that he and his companions found the head of one of these creatures where such a piece of earth had fallen down, and that with difficulty they broke out the teeth, which grew out of the mouth like those of an elephant. They likewise took some bones of the head, which appeared reddish, as if stained with blood; and afterwards found the fore foot of the animal, the circumference of which was as large as the waist of an ordinary man.

"There are different reports," continues Mr. Ides, "concerning this creature. The Tungusians, Ostiacks, and other heathens say, that the Mammoth lives continually under ground, and that they often see the earth heaved up when the beast is upon the march, which afterwards sinks down again, and makes a deep pit or cavity. They also believe, that if he comes so near the surface of the earth as to smell or discern the air, he immediately dies; which, (say they) is the reason that several of them are found dead on the high banks of the rivers, where they come out of the ground unawares. This is the opinion of the Pagans concerning the mammoth; but the old Russians of Siberia believe, that there were elephants in that country before the deluge, when the climate was warmer, and that their drowned bodies were driven by the waters into subterraneous cavities, where they have ever since lain frozen, and so preserved from putrefaction. But there is no absolute necessity to suppose the climate of Siberia was warmer before the flood, since

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the carcases of drowned elephants might float thither from distant countries. Some of these teeth are quite black and broken, but those which are sound are as good as ivory, and are accordingly sent to all parts of Muscovy.

This account is confirmed by Mr. Laurence Lang, in the journal of his travels to China, whither he went in 1715 with dispatches from his Czarish majesty. He takes notice of these bones, as being found about the river Jeniscea, and towards Mangasea, along the banks, and in the pits occasioned by the sinking of the earth. He calls them Maman bones, and says, that some of the inhabitants are of opinion they are not real bones, but a sort of fossil horn which the ground produces; and that others will have them to be the bones of the Behemoth mentioned in the book of Job, the description whereof they pretend is suitable to the nature of the Maman; those words in particular, that he is caught with his own eyes, (as some render the passage) agreeing with the Siberian tradition, that the beast dies upon coming to light.

To these accounts we may add another given by Basilius Tatischow, director general of the mines in Siberia, in a letter to the bishop of Gottenburg; wherein he mentions a large horn, or tooth, weighing one hundred and eighty-three pounds, which he had presented to his Czarish majesty, and another which he gave to the imperial academy at Petersburgh. He had likewise a third, larger than either of the former, which he caused to be cut, and he himself wrought several pieces of it, the ivory being very good. Part of the scull was corrupted by having lain in the ground, and was so large, that it seemed to him to be of the same

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size with that of a large elephant. He had also in his possession a grinder ten inches long and six inches broad, besides several ribs, shank bones, &c. found from time to time in that country. The same gentleman took no small pains to enquire into those pits and hollows, which the Pagan inhabitants of Siberia pretend are made by these animals when they walk under ground; and he found they were nothing but caverns, such as are common in other mountainous countries, and are made by subterraneous rivers and cataracts, which sometimes undermine the places through which they pass, so as to make the ground above them sink in, and form great cavities.

A particular description of the mammoth is given by Muller in the *Recueil des Voyages au Nord*. "This animal," says he, "is four or five yards high, and about thirty feet long. His colour is greyish; his head is long, and his front extremely broad. On each side, precisely under his eyes, are two horns, which he can move and cross at pleasure; and in walking, he has the power of extending or contracting his body to a great degree.

Mr. Pennant thinks it extremely probable that the mammoth still exists in some of those remote parts of the new continent which have not yet been penetrated by Europeans; and a Mr. Stanley (taken prisoner by some Indians near the mouth of the Tennessee) relates, that after being transferred through several tribes, he was at length carried over the mountains, west of Missouri, to a river where the mammoth's bones abounded, and were said to belong to a species of animals which still existed in the northern parts of the country.

Mr. Jefferson, in his *Notes on the State of Vir-*

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ginia, urges the following arguments to prove that the mammoth is quite a different animal from the elephant. 1. "The skeleton of the mammoth bespeaks an animal of five or six times the cubic volume of the elephant, as M. de Buffon has admitted. 2. The grinders are much larger, perfectly square, and the grinding surface studded with four or five rows of blunt points; whereas those of the elephant are broad and thin, and their grinding surface flat. 3. I have never heard an instance of an elephant's grinder being found in America. 4. From the known temperature and constitution of the elephant, he could never have existed in those regions where remains of the mammoth have been found." Mr. Jefferson concludes, that to whatever animal we ascribe these remains, it is certain such an one has existed in America, and that it was the largest of all the terrestrial beings of which any traces have ever been discovered. On the banks of the Ohio, and in many parts farther north, tusks, grinders, and skeletons of such magnitude as cannot even admit of comparison with any animal at present known, are found in great numbers, some lying on the surface of the earth, and some a little below it.

In the year 1767, Dr. Hunter, with the assistance of his brother, undertook to investigate this part of natural history; and he proved, that these fossil bones are not only larger than the generality of elephants, but that the tusks have more of the spiral curve; and that the thigh and jaw-bones differ, in several respects, from those of the elephant: it also appeared, on a careful examination, that the grinders belonged to a carnivorous animal, or at least to an animal of the

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mixed kind; and to be totally different from those of the elephant, which is well known to be of the graminiverous kind.

VEGETABLES.

THE following vegetables grow chiefly in Kamptschatka: the Shelmina, which has a blackish root, white within, from which rise two or three stalks, of about the height of a man; the leaves grow on long branches all over the stalk, having their upper part green and smooth, but underneath they are rough, and have reddish veins. At the top of the plant is a flower, which is like that of the service tree; but though the root, stalk, and leaves are very astringent, both the Russians and Kamptschadales eat them in the spring, and preserve the roots for the winter, when they pound and boil them with water, so as to make a kind of gruel, the root resembling in taste the Pistacho nut.

The Cotconia grows in great plenty on the banks of the rivers, and has a root of the thickness of a finger, black on the outside, and white within, from which two or more stalks rise, of the thickness of a goose quill, and about ten inches high. On the top, three oval leaves spread like a star, from the centre of which rises a short stalk, supporting a white flower. The fruit, when ripe, is soft, fleshy, as large as a walnut, and of an agreeable taste, like a good apple; but it must be eaten as soon as gathered, for it spoils if kept only one night. The root is eaten by the Kamptschadales, both fresh and dried, with caviare.

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Another remarkable plant has leaves like the hemp, but the flowers resemble those of the ragwort. The leaves, being dried and boiled with fish, give the broth the same taste, as if the flesh of the wild goat had been boiled in it: they fry the root in the fat of seals, and esteem it very delicate food.

The Zgate contains a poison of prodigious strength; for with the juice squeezed from the root, they anoint the points of their darts and arrows, which renders the wounds they give incurable, unless the poison be immediately sucked out: for if this be neglected, the wound turns blue and swells, and the patient dies within two days. Whales of the largest size, on being slightly wounded with a poisonous weapon, are unable to bear the sea; but soon throw themselves on shore, where they expire in great agonies.

ANIMALS.

THE Russian empire, and particularly Siberia, abounds with variety of animals, such as foxes, sables, ermines, lynxes, beavers, &c. whose furs are greatly esteemed, and make a considerable article of commerce. The beaver, or castor, is an amphibious animal, about three feet long, and twelve or fifteen inches broad in the chest and haunches. In the northern regions, these animals are usually black or brown, but their colour is lighter in more temperate climates. Their ears are small, their teeth strong and sharp, and they have a long scaly tail, which is flat like the blade of an oar, and serves them as a rudder to steer

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by, especially when they swim under water. Their fore feet resemble those of apes or squirrels, which they use, like those creatures, as hands when they eat; but their hind feet are adapted for swimming, having membranes between the toes, like ducks and other water-fowl. The skin of the beaver is covered with two sorts of hair, the one long, the other a soft down; very fine and compact. An attempt was made at Paris, in the last century, to manufacture this down, mixed with wool, into cloths, flannels, stockings, &c. but the project did not answer expectation, it being found by experience that the stuffs lost their dye when wet, and when dry again became harsh and stiff as felts; so that the beaver is now chiefly used in making hats, or as a fur for warmth or ornament.

The beaver has near its anus two bags or purses, containing a liquid matter called Castoreum, of considerable use in medicine. These bags are about the bigness of a goose-egg, and have been mistaken for the testicles of the animal; but they are found indifferently in males and females. The matter inclosed in these bags is oily*, of a sharp bitter taste, and disagreeable

* It is certain that ducks, geese, and all sorts of water-fowl, have a gland in their rump, from which they express with their bill an oily matter, wherewith they anoint their feathers, to prevent their being too much affected by the water; and the glands of the muscovy or musk duck afford an oil as fragrant as civet. It is therefore probable, that as the beaver is an animal which frequents the water, the castoreum is a substance provided by nature to grease and anoint his fur with, to prevent the water from soaking quite to his skin. And this seems to be confirmed by an observation, that the beaver frequently stops when he is hunted, and just going into the water, putting his mouth towards the anus, in order to

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smell; but when taken from the animal, it dries and condenses, and becomes of the consistence of wax by hanging in a chimney. The Russians prepare their castoreum in the following manner: they boil a few wood-ashes in a proper quantity of water, tie the bags in couples, and put them in the boiling water for seven or eight minutes. This done, they lay the bark of the birch tree on the fire, and smoke the bags over it for about an hour; and then letting them hang for a week or longer, till they are perfectly dry and hard, they pack them up for use or exportation. As to the virtues of castoreum, it discusses flatulences, corroborates the head and nervous system, raises the languishing spirits, and resists poisons. Hence it is of use in lethargy, apoplexy, epilepsy, vertigo, palsy, tremblings, hysterics, and cholic pains; and as it consists of very minute and penetrating parts, and is possessed of a certain acrimony, it seems proper to rouze and excite a languid circulation. It is also said to cure a ringing in the ears, difficulty of hearing, and pains in the teeth, and to correct the virulence of opium.

Sir Hans Sloane kept a young female beaver three months in his garden, till at last she was killed by a dog. She was about half grown, not exceeding twenty-two inches in length, from the nose to the root of the tail, which was eight inches long. She was very thick, and paunch-bellied; and the shape of the head, and indeed of the whole

squeeze out the oily liquor contained in his bags, to anoint his fur and preserve it from injury. Hence possibly the story had its rise, that this animal, sensible the hunters pursue him for the sake of his testicles, sometimes stops and bites them off, and leaves them to his pursuers, in order to save his life.

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animal, except the hind feet, and tail, much resembled that of an over-grown rat. They fed her with bread and water, and gave her some willow boughs, of which she ate but little; but being turned loose in the garden, she gnawed several vines as high as she could reach, quite down to the roots; she likewise gnawed the jessamine, and some holly trees, but these least of all. Being put into a fountain with some live flounders, she never offered to strike at them, as an otter would have done; so that fish does not seem to be the natural food of these creatures, but herbs, fruits, and branches of trees. In swimming, she made use of her hind feet only, holding her fore feet close up under her throat, and never moving them till she came to the side, and endeavoured to get out of the water. She swam under water as swift as a carp, and would sometimes come up to breathe, thrusting her nostrils just above the surface. Her hind legs being longer than her fore legs, she walked but slowly, or rather waddled like a duck; and if drove fast along, she could not run, but went by leaps or jumps, flapping her tail against the ground. — As to the wonderful polity observed amongst the beavers, their gnawing down great trees, their manner of building their habitations, and other particulars of that kind, we shall notice them in our account of Canada, which country abounds with those animals more than any other part of the world.

Amongst the furs of Siberia, that of the ermine is peculiarly admired for its whiteness and lustre. This creature is a sort of pole-cat or weasel, and has sometimes been confounded with the squirrel, and even with the sable, though they are three

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different animals. In order to heighten the charming white of the ermine, the furriers usually dot it with little tufts, or bits of the skin of a lamb of a very shining black, though some say they are pieces of the ermine's tail.

The sable is a sort of weasel found in several countries, but those of Siberia are the most esteemed. The blackest bear the highest price, and therefore the Russians have found out a way of dying the brown sable to the colour of that which is naturally of a most beautiful black: but lemon-juice will discharge this artificial colour, and detect the imposition.

The black fox is as well known in Siberia as the sable, nor is it common any where but in such cold countries, so that to suppose all animals have white hair in the northern climates, is a vulgar error. Some of them, indeed, are found perfectly white, which would naturally be of another colour in warmer countries; and some that are brown in summer, as hares for instance, turn grey or white in winter, and the next summer resume their former colour: but there are many which are not subject to such changes.

We have another sort of fur from Siberia, which is the skin of a squirrel found there and in other northern countries. These creatures are brown in summer, but grey in winter, at which time they are killed, and afford two different sorts of furs, the back being grey, and the belly as white as ermine. It is bordered on each side with a black streak, which is carefully preserved. When the fur is varied alternately with the skin of the back and belly, it is accounted the more valuable.

To these animals we may add a sort of mountain-cat, bigger than a fox, which for its sparkling

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eye is supposed by several naturalists to be the lynx of the ancients. This creature is found in other parts of Europe as well as in Muscovy, and its spotted skin is one of the most beautiful in the world, though it does not seem to be so much esteemed as it deserves.

There is a species of rats at Kamptschatka, which nearly resemble the lemming already described in treating of Norway; but these live in the woods, fields, and high mountains, in a kind of community, having very neat nests, which are large, and divided into different apartments spread with grass; in some of which they store up roots of several kinds, which they gather with great labour in summer, and lay up against winter; dragging them out in sunshiny weather, in order to dry them. All the summer they live upon berries, and such other food as they can find, never touching their winter provisions while any is to be procured in the fields. These, like the lemming, change their habitations, and sometimes they all leave Kamptschatka, which the natives imagine forbodes a rainy season, and a bad year for hunting; but when they return, they expect a fine one, and a good year for the chace; and therefore expresses are sent to all parts with the agreeable news.

When these animals migrate, it is always in the spring, first assembling in great numbers. They steer their course due west, crossing rivers, lakes, and even arms of the sea; and when they reach the shore, spent with fatigue, they lie as if dead upon the banks, till recovering their strength, they again pursue their march. Their greatest danger is lest some ravenous fish should devour them; but they have nothing to fear on land; for

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the Kamptschadales, on finding them weak on the banks, give them any assistance in their power. From the river Pengin they march southward; and about the middle of July, usually reach Ochotska and Judoma. Their troop is sometimes so numerous, that travellers are obliged to wait two hours for their passing by. They usually return to Kamptschatka about the month of October. It is extremely surprising, that such animals are able to pass over such an immense tract of land; and nothing can be more admirable than the regularity and order they observe in their march.

Among the amphibious animals of Kamptschatka we must notice the maneti, or sea-cow; which never comes on shore, but constantly lives in the water. It resembles the cow only in its snout, having neither horns, straight ears, nor legs. It is an animal like a seal, only vastly larger, being about twenty-eight feet long, and of such an enormous bulk, that it will sometimes weigh eight thousand pounds. Its skin is black and thick, like the bark of an aged oak; and so extremely hard, that it can scarcely be cut with an axe. Its head is small in proportion to its body, and its snout white and rough, with white whiskers about nine inches long. Instead of teeth, it has two flat white bones, one above, and the other below. Its eyes are black, and no larger than those of a sheep; which is remarkable in a creature of so monstrous a size, and its ears are only small openings; its neck can scarcely be discovered, but there are some vertebræ, which enable it to turn its head, and to hang it down in feeding like a cow. The body is round like that of a seal; the female has two teats on her breast; the tail is thick, with some resemblance to the fins of a fish. It has two fins under its neck,

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about twenty-one inches long; these it uses like hands, and not only swims with them, but takes hold of the rocks with such force, that on being dragged thence with hooks, it will leave the skin behind.

In calm weather these animals swim in droves near the mouths of the rivers: they bring forth in harvest, and never have more than one at a time. They are almost continually eating sea weeds, and have their backs and sides above water; upon which flocks of crows settle, to pick off the vermin they find there. They are caught with great iron hooks, somewhat resembling the fluke of a small anchor. A man in a boat, with three or four rowers, coming among the herd, strikes the hook into one of them; and then about thirty men on the shore, who hold one end of the rope that is fastened to the hook, draw the manetoe towards the land, while those in the boat stab and cut the animal till it dies. When one of them struggles to clear himself of the hook, those of the herd that are nearest, come to his assistance; some frequently overset the boat by getting under it, and others strive to remove the hook, by striking it with their tails, which sometimes succeeds. The male and female have such an affection for each other, that when one of them has in vain used every method in its power to give assistance, it follows the body after it is killed to the very shore, where it sometimes remains two or three days. Their flesh when thoroughly boiled, has a good taste, and resembles that of beef; the fat of the young eats like that of pork, and the lean is said to resemble veal.

The number of seals in the seas and lakes of Kamptschatka is so great, that all the islands and

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sandbanks are literally covered with them. There are here four sorts of those animals, one species of which is of the size of a yearling bullock, has a skin somewhat like that of a tyger, its back having spots of an equal size, and its belly being yellowish and white.

In spring and autumn are caught the sea-cats, thus called from the long hairs standing out on both sides of the mouth. But Dampier, who saw them in the south-sea, has termed them sea-bears. The largest weigh about eight thousand weight. Most of the females taken in spring are pregnant; and those that are near the time of parturition are immediately opened, and the young ones killed. They breed on the neighbouring coast of America, which has been found by the Russians to extend from east to west, almost to Kamptschatka; there they nurse their young three months, and return with them at the end of summer. The females give suck with two teats placed between their hind legs; but they have seldom more than one at a time. The young see when they are whelped, their eyes are as large as those of an ox; and they have thirty-two teeth, besides two tusks on each side, which begin to appear the fourth day after their birth. They are at first of a dark blue; but grey hair begins to appear in four or five days; and in a month's time, their belly is diversified with black and grey. The male is larger and blacker than the female; and they are so different in their form and strength, that they seem different animals: besides the former are fierce, and the latter mild and timid. The male has from eight to fifty females, of whom he is so jealous, that he will allow none to come near them; and though many thousands lie on the shore, every

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family lives apart the male with his females, young ones, [illegible] of a year old, that have not attached the[illegible] any male; so that the family someti[illegible] ists of a hundred and twenty. Those that are old, or have no mistress, live by themselves; and some lie asleep a whole month, without nourishment.

They attack all that pass by, for on seeing a man approach, some rush upon him, while others lie ready to support them. They will even bite the stones that are thrown at them, and rush with redoubled violence on him that throws them. If the hunters strike out their teeth with stones, or put out their eyes, they will not fly; and indeed they dare not attempt it, for could they save themselves from man, their own brethren would destroy them; for if any one seems to be driven back ever so little, others approach to prevent his running; and if he appears to design it, fall upon him. Sometimes they are seen fighting for a mile together, and then one may pass them without danger. If two fall upon one, others advance to support the weakest; for they will not allow of an unequal combat. While these battles last, those that are swimming in the sea, raise their heads, and look at the combatants, and at length come ashore, and increase their number. When only two of them fight, the battle frequently lasts an hour; sometimes they rest, lying by each other, then both rise at once, and renew the engagement.

When fighting, they hold up their heads, and turn aside to escape a blow; for while their strength is equal, they fight only with their forepaws; but one of them no sooner becomes weak, than the other seizing him with his teeth, throws

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him on the ground, and then the lookers on come to the assistance of the vanquished. Their most bloody battles are when one herd endeavours to carry off the mistress or young females of another. They also quarrel when one comes too near them.

If a man endeavours to take a young one, the male attacks him, while the female endeavours to escape with it; but if she drops it out of her mouth, the male leaves his enemy, and seizing upon her with his teeth, beats her against the stones, till she lies down as if dead; but she no sooner recovers, than she is said to crawl to his feet, which she licks and washes with a copious flood of tears, while the male, stalking about, gnashes his teeth, and tosses his head with every mark of disdain and indignation. They swim exceedingly fast, and when they happen to be wounded at sea, they seize the boats of the fishermen with their teeth, and drag them along so swiftly, that they seem to fly rather than swim upon the water; by which means the boat is frequently overset, and the people drowned.

Here are also sea-beavers, which resemble the others only in their downy hair; they are as large as the sea-cats; their head is shaped like that of a bear; and in their general form they resemble the seal; their teeth are small; their fore-feet are longer than those behind; their tail is flat, short, and sharp towards the point; and their hair thick and black; but that of the old ones is grey. This animal is so peaceable, that it never makes any resistance, and always endeavours to escape by flight. It is remarkable, that the females carry those of their young that cannot swim upon their belly, holding them with their fore-feet

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and swimming on their back. When pursued by the fishermen, they never quit their young till the last extremity; and should they happen to slip out of their paws, they instantly return to take them up again; whence the fishermen endeavour to kill or secure the young, as the most effectual method of taking their dams.

Of all the fish that are found in the seas and rivers of the Russian empire, which afford great plenty and variety, the sturgeon seems to be the most worthy our notice, on account of the vast traffic it occasions *. The sturgeon is a large sea-fish, which at its season swims up the rivers, having a sharp pointed snout, flat belly, and bluish back. They are of various sizes, sometimes fourteen or even twenty feet in length; but those of a middle size are reckoned the best. When fresh, they are delicious food; and to keep them they are salted or pickled in large pieces, and put up in cags from twenty-five to fifty pounds. The greatest sturgeon fishery in the world is at the mouth of the Wolga, which falls into the Caspian sea, where a multitude of hands are employed. The fish are not taken with nets, but in a kind of enclosure, formed with huge stakes, disposed in triangles, representing the letter Z several times repeated; which being open on the side towards the sea, and closed on the other, the fish, ascending in the season up the river, embarrass themselves in these narrow angular retreats, and not being able to turn back again by reason of their bulk, are easily struck, and killed with a sort of harpoon or javelin.

* Sturgeons, with us, are reckoned among the number of royal fishes, as belonging to the king when left on shore, but when taken out at sea are the property of the person who takes them.

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It is only the small and young sturgeons that are pickled for eating; but the great object of this fishery is the roe or spawn of the fish, a commodity as much used in Muscovy as butter in Holland. The roes are cured by salting, and drying them in the sun or by the fire, and thus prepared it is called caviar, and is sent up the Wolga to Moscow, from whence it is distributed into all parts of the empire, where it is of great service to the people, on account of the several fasts which they observe with the utmost strictness. If good, the caviar is of a reddish brown colour, and very dry. Some persons eat it with oil and lemon, others with vinegar; sometimes it is eaten alone with bread, and sometimes only as a sauce or pickle, like anchovies.

On the coast of Kamptschatka are an inconceivable quantity of fish, particularly a large kind of salmon, cod, skate, turbot, herring, lampreys, and many others, which come from the sea in such numbers, that they frequently stop the course of the rivers, and cause them to overflow their banks; and when the waters retire, a surprising quantity of dead fish remain on the shore.

BUILDINGS.

IN a country so rude and unpolished as Muscovy has been till of late, we cannot expect to find many instances of noble or elegant architecture; but there are, in this empire, some structures which have engaged the attention of our most intelligent travellers, and have been deservedly admired.

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The cathedral of the Assumption of the Virgin Mary, at Moscow, has long been appropriated to the coronation of the Russian sovereigns, and is said to be one of the most splendid churches in Muscovy. The screen is in many parts covered with plates of solid silver and gold richly wrought; the sacred utensils and sacerdotal vestments are extremely magnificent; and from the centre of the roof hangs an enormous chandelier of massy silver, weighing two thousand nine hundred and forty pounds: this valuable ornament was made in England, and was presented to the cathedral by Morosof, prime minister of Alexey Michaelovitch.

Several of the paintings which adorn the interior of this church are of colossal size, and some of them were executed so early as in the latter end of the fifteenth century. Among the most famous of these pieces is a head of the blessed virgin, supposed to have been drawn by St. Luke, and greatly celebrated, among the Russians, for its sanctity and power of working miracles. The head is encircled with a glory of precious stones, and the body is richly ornamented; but as the hands are gilded, and the face is almost black, it has a most grotesque appearance. According to the tradition of the church, this picture was brought from Greece to Kjof, when that city was the residence of the Russian sovereigns; from thence it was removed to Volodimir, and afterwards transferred to Moscow.

The cathedral church of St. Michael is built in the same style of architecture as that of the assumption, and is as richly decorated. From the time that Moscow began to be the imperial residence down to the close of the seven-

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teenth century all the czars have been interred in this church, except Boris Godunof, whose remains are deposited in the convent of the Holy Trinity; the czar, under the name of Demetrius, who perished in a tumult; and Vassili Shuiski, who died in captivity at Warsaw.

The bodies of the Russian monarchs are not deposited in vaults, or beneath the pavement, but are entombed in brick sepulchres, built in the shape of a coffin, and raised about two feet from the ground. Mr. Coxe observes, that when he visited Moscow, the most ancient tombs in this cathedral were covered with palls of red cloth, others with red velvet, and that of Peter II. with gold tissue, bordered with silver fringe and ermine. Each has, at its lower extremity, a small silver plate inscribed with the name of the deceased sovereign, and the era of his death; and upon great festivals all these sepulchres are covered with rich palls of gold or silver brocade, studded with pearls and jewels. The tombs of the princes who never reigned are in a separate chapel; and the princesses of the imperial family are interred in the adjacent nunnery of Viesnovitskoi.

The church of the Holy Trinity, sometimes called the Church of Jerusalem, situated in the Khitaigorod is a noble edifice, ornamented with a high steeple, and nine or ten domes. It appears from very respectable authority that this structure was raised during the reign of Ivan Vossilievitch II. though it is said to have been built under the reign of John Basilides I. and it has even been asserted that he caused the eyes of the architect to be put out, that he might never contrive or behold its equal.

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Of the other churches of Moscow, which are extremely numerous, Mr. Coxe has given a general description; the substance of which we shall take the liberty to lay before our readers.—The ancient churches of Moscow are generally square buildings, with a cupola and four small domes, some of which are of copper or iron gilt, and others of tin, either plain or painted green. These domes and cupolas are usually ornamented with crosses entwined with thin chains or wires, and having two transverse bars, under which is frequently placed a * crescent.

In the body of the church there are generally four square pillars, which serve to support the cupola, and are painted with representations of our Saviour, the Blessed Virgin, and a variety of saints. Many of these figures are daubed upon large massive plates of brass or silver, and the head of each is environed with a glory, composed of pearls and precious stones. Some of the most revered saints are adorned with silken drapery, fastened to the walls and studded with jewels; some are painted upon a gold ground; and others are gilded in all parts except their face and hands.

* Mr. Coxe observes, that none of the Russians could give him any satisfactory account of the adoption of this singular ornament: but Dr. King explains it in the following manner. "When the Tartars (to whom Muscovy was subjected two hundred years) converted any of the churches into mosques, they fixed the crescent upon them as a badge of their own religion; but when the grand duke Ivan Basilovitch had delivered his country from the Tartarian yoke, and restored those edifices to the Christian worship, he left the crescent remaining, and planted the cross upon it, as a memorial of his victory over its enemy."

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The sanctuary, or shrine, is separated from the body of the church by a screen, which is always richly ornamented, and hung with sacred pictures. In the centre are the royal doors leading to the shrine, within which is the holy table with four small pillars to support a canopy over it. Upon this table are laid the cross, the gospel, and a box, containing part of the consecrated elements; and from the canopy is suspended a dove as a symbol of the Holy Ghost.

Over the door of each church is a portrait of the saint to whom it is dedicated. This appears to be an object of universal veneration among the common people; for they invariably pay homage to it as they pass along, by taking off their hats, crossing themselves, and bowing their heads to the ground.

The cathedral of St. Peter and Paul, at Petersburgh, is in a different style of architecture from that usually employed in the erection of churches for the service of the Greek religion. Instead of domes, it has a spire of gilded copper, the highest part of which rises about two hundred and forty feet from the ground. The interior decorations are more elegant and appropriate than those in the churches of Moscow; and most of the paintings are executed in the Italian style. In this cathedral repose the bodies of Peter the Great, and of all the succeeding sovereigns, excepting those of Peter the Second, who was buried at Moscow; and the unfortunate Peter the Third, who lies interred in the convent of St. Alexander Nevski. The tombs are all of marble, constructed in the same form as those at Moscow, and marked with inscriptions in the Russian tongue. Mr. Coxe informs us, that these tombs, at the time of his visit, were covered with gold brocade, bordered with

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silver lace and ermine; and he observed, near the sepulchre of Peter the Great, some Turkish colours, which were taken in the naval engagement of Tchesme, displayed during a solemn procession in honour of that victory, and placed by the hand of the late empress, at the tomb of the sovereign who was the founder of the Russian navy.

The cathedral of St. Sophia, at Novogorod is, probably, one of the most ancient churches in Russia. It was begun in the year 1044 by Vladimir Yaroslavitch Duke of Novogorod, completed in 1051, and called St. Sophia from the church of that name in Constantinople. It is a lofty square building, with a gilded cupola and four tin domes: the entrance is through a pair of brazen gates, ornamented with various scriptural histories in alto relievo; and in the interior are twelve massy pillars, whitewashed, which, as well as the walls, are covered with paintings of our Saviour, the Virgin Mary, and a great number of saints.

Several princes of the ducal family of Russia are buried in this cathedral, the most ancient of whose tombs are of carved wood, richly gilded, and surrounded with iron rails; the others are of brick and mortar. Within the sanctuary, the walls are covered with curious Mosaic compartments, of coarse workmanship, and great antiquity.

The cathedral at Smolensko, is a magnificent pile of building, erected upon a spot where formerly stood the palace of the ancient dukes of Smolensko. The inside walls are covered with coarse portraits of saints, &c. which are extremely numerous in the Greek religion. The shrine, or sanctuary, into which none but priests are admitted, is divided from the body of the church by a screen and folding doors, ornamented with twisted pil-

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lars, of the Corinthian order, richly carved and gilded.

The cathedral church of Wologda is an ancient and majestic structure, adorned with five tin cupolas, and as many gilded crosses, which, when the sun shines upon them, make a very glittering appearance.

The palace of Moscow, inhabited by the ancient czars, stands at the extremity of the Kremlin. Some part of this edifice remains in the same state in which it was built under Ivan Vassilievitch I. but the remainder has been successively added at different times, and in various styles of architecture. The top is crowded with small gilded globes and spires, and the front is ornamented with the arms of all the provinces which compose the Russian empire. Most of the apartments are remarkably small; but the council-chamber is a large vaulted room of a noble appearance, and the cieling is supported by an enormous pillar of stone, which, upon some occasions, has been decorated with a profusion of gold and silver vessels. This palace appears to have been the birth place of Peter the Great; and here the czars formerly held their court in all the splendor of Eastern magnificence, though since the late improvements in architecture, it is far surpassed by the ordinary mansions of the nobility, and is not deemed suitable even for the temporary residence of the sovereign.

The author of Lord Carlisle's embassy has given a very animated description of the magnificence of the court of Alexey Michaelovitch at the first audience of their ambassadors, which, as it relates to the imperial palace of Moscow, we shall lay before our readers. "And here (in the audience chamber) we were like those who coming sud-

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denly out of darkness are dazzled with the brightness of the sun; the splendor of their jewels seeming to contend for priority with that of the day; so that we seemed lost in this confusion of glory. The czar, like a sparkling sun, (to speak in the Russian dialect) darted forth most sumptuous rays, being magnificently placed upon his throne, with a sceptre in his hand and a crown upon his head. His throne was of massive silver gilt, and wrought curiously on the top with several works and pyramids, and being seven or eight steps higher than the floor, it rendered the person of the prince transcendently majestic. His sceptre glittered all over with jewels; his vest was set in a similar manner, down the opening before; and his collar was equally brilliant.

"Below the throne stood four of the tallest nobles, each bearing a battle-axe upon his shoulder, and occasionally casting their eyes upon the czar, with the most profound gravity, as inviting us to an admiration of his grandeur. Their habits were no less remarkable than their countenances, being all clothed in white vests of ermine, ornamented with gold chains. But that which was most admirable was the equipage of the Boyars present at this audience, who appeared like so many beams of the sun elevated in his triumphant car, and seemed to have no lustre but to do homage withal to their great monarch. They were about two hundred, clothed with vests of cloth of gold, cloth of silver, or velvet studded with jewels; and they were all seated in order upon benches hung with tapestry."

In the treasury of this palace are kept the diadem, jewels, and imperial robes, used at the coronation of the Russian sovereigns, besides several

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curiosities, which are said to relate to, and illustrate the history of the empire.

On the bank of the Yauza stands a palace, which was erected for the accommodation of the late empress whenever she chose to visit Moscow: this pile is not, according to our common acceptation of the word, a single edifice, but a vast assemblage of buildings, distributed into several streets, and bearing the appearance of a little town. The base of all these buildings is of stone, but so remarkably soft, that it seems scarcely adequate to the support of such a superstructure; the bricks used in the remainder of the fabric are also so badly prepared, that they may be crumbled with a touch; and it is said, that the walls are, in many places, out of the perpendicular line.

The gardens which belonged to the old palace of the czarina Elizabeth, are still retained, and contain some of the best gravel walks that are to be seen in Russia. In some parts the grounds are laid out with much taste and elegance; but very frequently the eye is disgusted by rows of clipped yew trees, long straight canals, and a profusion of preposterous statues. In one place Hercules presides at a fountain, with a train of gilded cupids, dolphins, and lamias; and in another a female figure holds a cornucopia reversed, from which, instead of fruits, grain, and flowers, she appears to pour out crowns, coronets, and mitres. In short, every little structure was a pantheon, and every grove was the residence of a sylvan deity. All these monuments of a grotesque taste, however, are to be removed, and to be succeeded by more elegant and natural ornaments.

The winter palace at Petersburgh is built of

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brick stuccoed white, and was erected by the empress Elizabeth in a very lively situation, on the banks of the Neva, and in the centre of the town. Contiguous to this is a small palace (built by the late empress) called the Hermitage, communicating with the winter palace by means of a covered gallery. When the sovereign is in this part of the building, he is in retreat, and there is no drawing-room, from which it takes its appellation, but it bears no other resemblance to a hermitage except its name; for the apartments are remarkably spacious, and decorated in a superb style of royal magnificence. Here also are two galleries of paintings, which have been recently purchased in Italy.

A winter, and summer garden, comprised within the site of this building, are singular curiosities, and such as do not occur in any other European palace. The summer garden, in the Asiatic style, occupies the whole level top of the edifice, and produces a very pretty effect. The winter garden is an high and spacious hot-house, entirely roofed and surrounded with glass frames: it is laid out in gravel walks, ornamented with parterres of the most beautiful shrubs and flowers, and peopled with birds of several sorts and different climates. This exhibits a very agreeable scene, and is peculiarly delightful when contrasted with the dismal aspect of a Russian winter.

The palace of Peterhorf is situated about twenty miles from the capital, and commands a fine view of Cronstadt, Petersburgh, the intervening gulf, and the opposite coast of Carelia. The suite of apartments are very magnificent, and the presence chamber is ornamented with portraits of the sovereigns of the house of Romanof, who have reigned

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since the year 1613. The most conspicuous among these is a whole length figure of the late empress as she made her triumphant entry into Petersburgh on the evening of the famous revolution which placed her upon the throne. She appears habited, like a man, in the uniform of the guards, with a branch of oak in her hat, a sword in her hand, and mounted on a white horse.

The gardens of Peterhorf have been frequently celebrated for their taste and elegance, and are sometimes the scenes of most splendid entertainments. From their number of jet d'eaus, basons, cascades, &c. they have been compared to those of Versailles, and in one respect they may be deemed superior; for whereas the water works at Versailles only play upon particular occasions, those of Peterhorf are perpetual.

We shall not detain our readers with a minute description of the gilded statues, silver dolphins, and other similar ornaments which are scattered in great profusion; but there are some objects which, as they may afford entertainment, we must not omit. These are the statues of two gladiators, placed in a bason of water, and holding a brace of pistols, which they point at each other in threatening attitudes, while the water gushes impetuously from the barrels.

Among the various buildings contained in this garden, is one erected by Peter I. and called *Monplaisir*, as having been the favourite retreat of that monarch. It is built of brick in the Dutch style, and roofed with iron: the windows reach from the ground to the top, which, added to the length and lowness of the edifice, give it the appearance of a green-house. The habitable part consists of a hall and six small rooms, furnished

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with the utmost neatness and simplicity; and the mantle-pieces are ornamented with curious old porcelain, which was brought into Russia when the communication was first opened between that country and the Chinese empire. The bed-room is white washed, and the floor covered with a coloured sail cloth: it contains a barrack bedstead without curtains. In the adjoining galleries are several portraits of the emperor, under the character of *Master Peter* when he worked at Sardam; and one of a beautiful Dutch girl who is said to have been his favourite mistress.

The Mountain of Sledges, or the flying mountain, is one of the most curious and extraordinary buildings in the gardens of Peterhorf. In the middle of an oblong area, enclosed by an open colonnade about half a mile in circumference, stands this flying mountain, extending nearly from one end to the other It is a wooden building supported by pillars, and represents a mountain composed of three principal ascents, gradually diminishing in height, with an intermediate space to resemble valleys; and from top to bottom is a floored way, in which three parallel grooves are formed. The mode of using it is as follows.—A small carriage, containing one person, being placed in the centre groove upon the highest point, goes with great rapidity down one hill; the velocity which it acquires in its descent carries it up a second; and it continues to move in a similar manner until it arrives at the bottom of the area, where it rolls for some time on the level surface, and stops before it reaches the boundary. It is then placed in one of the side grooves, and drawn up by means of a cord fixed to a windlass.—At the top of the mountain is an apartment for the

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accommodation of the court and principal nobility; and several thousand spectators may also be accommodated within the colonnade and upon its roof.

The imperial palace of Sarsko-Selo, situated about fifteen miles from Petersburgh, was the favourite summer residence of the late empress, where she used to live in a more retired manner than when she was at Peterhorf. This is a brick edifice stuccoed white, and adorned with a profusion of gilded statues and other exterior ornaments; but it is of a disproportionate length, and built in a remarkably heavy style. The apartments are equally large and magnificent; and one room in particular is richly incrusted with amber.

The gardens are laid out in the English taste, and are prettily diversified with wood and water. Among several beautiful bridges is one built after the model of lord Pembroke's palladian bridge at Wilton: the lower part is of granite, and the colonnade of fine marble. Several buildings have also been raised in these gardens in honour of some persons who have distinguished themselves in the imperial service: among these are a triumphal arch to prince Orlof, for his humane exertions to check the progress of the plague at Moscow; a building to Count Alexey Orlof, in memory of the naval victory at Tchesme; and an obelisk to Marshal Romanzof for his brilliant successes against the Turks.

The palace of Oranienbaum, near the shore of the gulf of Finland, was erected by prince Menzikoff while he was in the meridian of his power, and afterwards chosen for the favourite residence of Peter III. The middle part of the building is the same as constructed by Menzikoff, and consists

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of two stories, containing a range of small apartments; but the two wings were added by the emperor.

At a small distance is the fortress, surrounded with a ditch and rampart, and strengthened with bastions. This was raised by Peter III. when he was great duke, and contains a building, called the governor's house, which he generally inhabited himself while his court resided in the palace.

The governor's house is a brick building stuccoed, has seven or eight windows in front, and consists of about eight small apartments. It remains precisely in the same state as during the life time of the emperor, neither the furniture nor the bed in which he reposed the night preceding his deposition being removed: the bedstead is hung with curtains of pink and silver brocade, and ornamented at the top with a plume of red and white feathers; and over the bed is thrown a white satin coverlet.—In another part of the building are a neat cabinet, hung with silk; and a gallery of pictures.

In the garden is a beautiful pavilion, containing eighteen apartments, each furnished in different tastes; namely, the Greek, Turkish, Chinese, &c. As this elegant retreat is situated in the bosom of a thick wood, and the approaches to it are all circular, a stranger has not the least glimpse until he arrives at it; and as it usually excites an emotion of surprise, it has received the appellation of *Ha!*

On the island of Petersburgh is a wooden hovel, which, though simple in itself, is rendered worthy of particular attention by its having served for the habitation of Peter the Great, while the adjacent fortress was erecting. It still remains in its original state, and stands under a brick building,

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which has been purposely raised in order to preserve it from destruction. The house is no more than a ground floor, and consists of three apartments, about eight feet in height: that for the reception of company, as it is called, is fifteen feet square; the dining room is fifteen feet by twelve; and the bed chamber is ten feet square.

CANALS, ROADS, &c.

THERE is no kingdom, probably, in the habitable world, where the inland navigation is carried through such a vast extent of country as in Russia; for it is possible to carry goods by water from St. Petersburgh to the * frontiers of China, with an interruption only of about sixty miles; and from Astracan to the Russian capital they may be conveyed, through a tract of one thousand four hundred and thirty miles, without once landing them.

The celebrated canal of Vishnèi-Voloshok, which forms the water communication between the Caspian and the Baltic, was constructed under the reign of Peter the Great, and has received such considerable improvements by order of the late empress, that the transportation of merchandize is greatly facilitated, and vessels are enabled to reach Petersburgh in half the time which they formerly employed.

By an attentive examination of a map of Russia, we perceive that the Tvertza unites with the Volga at Tver; that the Shlina forms a lake

* A distance of 4472 miles.

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which gives rise to the Masta; that the latter, after a course of two hundred and thirty miles, falls into the lake Ilmen; and that the river Volkof, issues from the Ilmen, and flows about a hundred and thirty miles to the lake Ladoga, which supplies the Neva; so that the Shlina, Masta, Volkof, and Neva may be properly considered as the same river, flowing through different lakes, and only changing its name at different intervals. Hence it appears, that a junction of the Baltic and Caspian seas is formed by uniting the Shlina which communicates with the former, to the Tvertza which flows, by the Volga, into the latter. This junction is happily effected by the canal of Vishnèi-Voloshok, where the Shlina is joined to the Tvertza by the following canals and rivulets.

Near the village of Klutshina a cut was dug to the lake of the same name; a second to the lake of Gorodolub; and a third from thence to the Zna. A lock of four gates was also constructed, just below the first cut, in order to stop the course of the Shlina, and to convey water to the Zna above Vishnèi-Voloshok. To keep this supply of water in reserve, a lock of seven gates was built across the Zna; that rivulet and the Tvertza were united by a canal; and another canal was opened from the Zna to the Shlina.

These canals are all supplied with water, and vessels are navigated from Tvertza into the canal of the Zna by the following operations.

The locks of Klutshina and those of the Zna being closed, the lock of Tvertza is opened; the waters of the Zna and Shlina are conveyed into that river; and the vessels are enabled to pass into the Zna at Visknèi-Voloshok. When a cer-

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tain number have been admitted, the lock of the Tvertza is shut, and (the water being raised by means of the lock of seven gates) that of the Zna is opened, and the barks are then gradually let down a small fall, to the number of about twenty in an hour. Having thus passed into the Shlina, they proceed, without farther interruption, to the beginning of the Masta.

With respect to the navigation of the Masta, Mr. Coxe informs us, that "several rivulets falling into it are confined by locks, which, being opened successively as the barks are passing, fill the river, and render the shallows navigable; and, being again closed, hold perpetual reservoirs of water for the same purpose." This operation is generally repeated five or six times in the summer; but by the recent construction of some other works, a considerable addition of water has been obtained; and it is highly probable, from this improvement, that the Tvertza will become always navigable, and that the lock of the Masta will only be shut for a short time. In autumn the navigation from Vishnèi-Voloshok to Petersburgh is performed in little more than a month; in summer it occupies but three weeks; and in spring only a fortnight is required.

The canal of Ladoga, annexed to that of Vishrèi-Voloshok, was begun in 1718, by order of Peter I. and completed under the auspices of the empress Anne. It extends, without interruption, from the Volkof to the Neva; being about sixty-seven miles long and seventy feet broad. Its mean depth of water in summer is seven, and in spring ten feet. It is supplied by the Volkof and several rivulets, which are admitted into the canal by floodgates, and the superfluous water is dis-

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charged through a number of openings on the opposite side.

A scheme has been recently projected to form a communication between the Ladoga and Bielo Ozero to the Duna, in order to effect a junction between the White Sea and the Baltic, and to improve the inland commerce between Petersburgh and Archangel. This plan has been adopted, and a cut of about seven miles is already opened from the Volkof to the Sjas.

The project of uniting the Caspian and the Baltic with the Black Sea by a junction of the Don and the Volga, was planned by Peter I. and the canal was actually begun under his inspection; but afterwards laid aside, in consequence of some irruptions of the Tartars. The scheme was revived by the late empress, and professor Lovitz was ordered to carry it into execution; but whilst he was tracing out the canal and making other preparations he was wantonly murdered by the rebel Pugatchef.—According to Lovitz, the direct distance between the two rivulets of Ilohffla and Camasinka (the former of which falls into the Don and the latter into the Volga) is only five miles; and if these were united by a canal, the Black Sea would be joined with the Caspian and the Baltic. But as the river Don is only forty miles distant from the Volga, and the land carriage is equally cheap and commodious, it is questioned whether any advantages resulting from the projected canal would be equivalent to the expence of its construction.

Among other grand works, Peter I. caused a road to be cut from Petersburgh, that was to extend seven hundred and thirty-four wersts, or four hundred and eighty-seven English miles, in a direct line; but this is not yet completed. Vast forests of fir,

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birch, and other trees, were cut through, and a passage made through morasses, till then thought impassable. Immense quantities of timber were hewn down, ditches were made, and the earth being thrown up and levelled, straight firs, with their surfaces made plain, were laid close to each other upon it. These were supported by a foundation of the same kind of timber, composed of a row of trees, on each side secured by cross timbers. This road of timber was carried according as the land required, for about a hundred and fifty wersts, and, as Mr. Hanway calculated, contained two millions and one hundred-thousand trees.

To these works it will be proper to add, that since the building of Petersburgh, the whole road between that city and Moscow has been planted with trees, to distinguish it in winter, when the country is covered with snow. These are firs planted on both sides, at the distance of twenty yards from each other, which, at a moderate computation, amount to a hundred and twenty-eight thousand four hundred and eighty trees, and at certain distances, are usually great piles of wood, in order to give light to the court, if they pass through that road in the night. On these occasions, her late Imperial majesty was drawn in a kind of house, that contained her bed, a table, and other conveniencies, where four persons might take a repast. This wooden structure, which had a sloping roof, and small windows, to admit as little cold as possible, was fixed on a sledge, and drawn by twenty-four post-horses; and if any of them failed on the road, others were ready to supply their places. The empress was seldom more than three days and nights on the way; notwithstanding her having

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several small palaces, at which she sometimes stopped to refresh herself, and the distance being no less than four hundred and eighty-eight English miles.—Peter the Great once made the journey in forty-six hours, but did not travel in the same carriage; and Mr. Busching observes, that it is not uncommon to perform it with post-horses, in seventy two hours.

ANTIQUITIES.

AT Kasimof, about a hundred and thirty miles from Moscow, are some handsome remains of Tartarian buildings, which ought to be preserved for the admiration of posterity. On an elevated spot in this neighbourhood stands a high circular tower of a ruined temple, composed of hewn free-stone, which appears to have been taken out of a quarry at eight miles distance. Here also were a triumphal arch with Gothic ornaments and Arabic inscriptions; an oblong square-built mansion; and a mausoleum near the common burial ground. But the triumphal arch has been demolished and converted into a lime-kiln; and the mansion (supposed to be the residence of a Tartarian prince) has likewise been levelled with the ground.

The mausoleum of the khans is an oblong square sided building, composed of free-stone, and ornamented round the top with a cornice. The western end contains a small vault or closet, which seems to have been designed for private devotion, according to the custom of the Mahometans; and the other part has a vault with several tomb-stones. The length of the building from east to west, is

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rather more than forty-seven English feet, the breadth from north to south about twenty-six, and the height near sixteen feet.

The entrance to the great vault is, on the southern side of the building, by a small door, on which is a marble slab, with the following inscription in Arabic.

TO THE SOLE GREAT GOD!

THE PRINCE OF THIS PLACE,

SCHAGALI-KAN,

SON OF SULTAN SCHICH AULEAR.

The 21st day of the Month *Ramasan* in the year 963.

The great vault is about twenty-one feet wide, seventeen broad, and twelve feet high. The northern wall has two windows, and the eastern wall but one, which seem to have been formerly grated with iron-bars. On the ground within the walls are eight tumuli or hillocks, about seven feet long and covered with stones. At the head of each grave-hill was erected a tomb-stone five or six feet high, shaped off at the top in an obtuse angle, and ornamented with flowers, stars, and Arabic inscriptions: but only two of these stones are now standing; the others being broken and scattered about. In a low sepulchral cave underneath these tombs, dead bodies have been laid on a wooden scaffold; but as modern curiosity has troubled their repose, nothing is now to be seen but scattered skulls, rib-bones, and some yellow, green, and brown striped taffety, which has preserved its colour tolerably well.

On the eastern side of the village Bulgari are many curious pieces of antiquity; the most remark-

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able of which is a misgir, or tower, about eighty-four feet high, built with hewn free-stone, and in tolerable preservation. It has a winding stair-case, consisting of seventy-two steps, each step twelve inches and three quarters high. The entrance is on the south, and has a strong iron hinge remaining, on which hung the door; and in several places there are openings for the admission of light.

Adjoining this tower was an irregular square building, part of which is still remaining, and appears to have been designed for a house of prayer: the wall is built with stones, flints, lime, sand, &c. and the workmanship is extremely clumsy. To the east of this are some remains of a small Tartarian edifice solidly built with stones of different sizes and covered with a vaulted roof. This building has been recently converted into a chapel, and dedicated to a saint called Nicholao the Miraculous.

At some distance, toward the south-west, stands a little square building of solid free-stone, the vaulted roof of which is fallen in on one side. The entrance is in the west front, and on each side is a false window. This place is supposed to have been wholly devoted to purposes of devotion.

On the southern side of the village are some vestiges of a more extensive edifice, which the peasants distinguish by the appellation of "the town house." The square division of rooms appear, from their foundations, to have been entrances from without, but not to have had any communication with the central apartments, and also not to have been higher than the second story. There are three small rooms in the eastern front, two larger ones in the southern, and an oblong one in the western. In the northern

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corner is an oblong foundation which touches the principal building only at its angle, and the northern front, where the entrance is, exhibits no appearance of side rooms.

About seven hundred feet from this edifice is another ancient and strong built one, of considerable magnitude and remarkable architecture. Its northern part is built, on a foundation of limestone, with large Tartarian bricks; its entrance is on the east; and in the side walls are several openings to let in the light. It is divided, by a cross wall, into a square anti-chamber and an oblong saloon, the latter of which communicates with the principal part of the building. Its greatest space is divided into four closets, between which is a broad passage built in the form of a cross, and lighted by a small window on each side, and an octagonal sky-light in the roof. The corner closets are exactly square, and have their doors in the angle, leading into the cross passage.

At the southern end of this building is an addition of three rooms, the smallest of which has no entrance nor opening, except a breach into the south-eastern corner of the centre building. Under this is a vault and a subterraneous passage from the southern wall: but as part of the vault is broken in, a descent is rendered impracticable.

In the vicinity of Bulgari have been found many ancient tomb stones, part of which have been used in the foundation of the new church of Usprenski, and the remainder lie scattered about, upon the ground. These stones are of various sizes, but nearly resemble those at Kasimof, and are all inscribed with Arabic or Armenian epitaphs. The Arabian ones include only a space of a hundred and twenty-three years, viz, from the

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year of the hegira 619 to 742; during which time Baty-Khan is said to have reigned in this place. There are three in the Armenian language, one dated 557; and two 984, and 986, which is in the middle of the sixteenth century, comprehending a space of four hundred and twenty-nine years.

Many little silver and copper coins are frequently found in the fields of Bulgari, some of which are stamped with an Arabic or Kufischian inscription; and others are marked with stars, circles, &c. Besides these coins, travellers sometimes meet with toys neatly wrought in gold or silver, a variety of curious weapons, and corals that have been turned with a lathe into the form of buttons, and pierced with small holes.

The district of the Beltirs, between the mountains and the low grounds of the Abakan, is covered with several old tombs and monuments, of an extraordinary size and appearance. Among these graves, which are surrounded with a square wall of granite rock, and paved within, like a flat earth hillock, are many stones, ornamented with a rough sculpture of human faces; and these, as well as other stone images on the steps of the Jenisei, have been evidently erected long before the time of the Kirguese.

About a mile and a half above the habitation of the Beltir chief, stood two narrow stones, seven feet high, flat on both sides and truncated; but these now lie along upon the ground. On the upper end of each is a rough representation of a human face; and on one of them are the figure of a dromedary and a ghastly image of a child.

On the right edge of the stone which the Beltirs call *Kuwi Tasch*, or man stone, is carved a man on

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horseback, with a lance before him; and a little higher is represented a bent bow and arrow. The figures on the opposite edge are rendered undistinguishable by the ravages of time; but on the top may be discerned a lance with a triple flag, and below these are some square lines and the representation of a boat.

At a considerable distance from these stones, on the west side of a large tomb, stands a piece of granite rock about the height of a man, and edged in such a manner at the top that its point and carved side turn eastward to the tomb. Near the point of this granite is a large female face, much more relieved than those on the other stones, but considerably worn and decayed by time; and on the same side are some square lines and carved figures. This piece of rock is known among the heathen Tartars of the district by the name of *Utu Kurtejak*, or "the big woman," and is frequently invoked for success in sable-hunting.

About a mile and a half higher up the Abakan is a monument which Dr. Pallas pronounces the finest of all Siberian antiquities. This is a tomb four fathoms high, and a hundred and fifty paces in circumference, raised upon an eminence, so as to be seen at a great distance. Four other tumuli lying on the north-west and south-west, form a triangle with the great one; in the opening of which, three square sided sand-stones are so placed, that their flat sides face the north and south, each stone standing about four feet from the other. On the edge of one of these is a very long but distinguishable face, which the Tartars call *Kitschi Kurtejak*, or "the little woman:" and the flat side of the stone is ornamented with some drawings. A very large stone, standing on the

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west of the largest tumulus, has many figures on the south-side, which seem to be either Tartarian hieroglyphics or inscriptions. Professor Pallas is of opinion, that some of these pieces are the sign-manual of the deceased; for, he observes, the Pagans in Siberia, like the common people in Russia, who cannot write, have a particular mark or signature, which they affix to writings, instead of their name.

All the monuments about the Abakan are so similar in their external appearance, that they must certainly have been tombs of the same nation. The only difference is, that some have the ground flat within the square walls and others raised: but this may probably be a mere distinction of rank or tribe. The granite stones which border these graves lay along, with one edge upon the ground, none being placed upright, excepting those at the north-east, south-east, and south-west angles. In some of the graves, the space within the walls is divided into two or three parts by rows of stones, one of which is generally larger and more elevated than the rest; and it is observable, that some are paved on the top with granite-stone, whilst others are only filled up with earth.

Dr. Pallas tells us, that he ordered one of these tumuli to be opened; but no regular coffin was found, only a mixture of decayed bones of several bodies, which had been laid with the legs toward each other. These relicks were found at the depth of four feet and a half, together with some broken pieces of earthern vessels, several large basons, and a bead of a greenish enamelled substance. In another grave, only filled with earth, and quite flat at the top, were found some large granite stones lying flat, and the earth filled up

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beneath them; yet there had evidently been a long square space made with stones, running in an east and westerly direction. Here were found the bones of a man in such order as to prove, that he was laid with his head toward the east; but of the skull and teeth nothing remained, and the other bones were soft and imperfect. In this grave, Dr. Pallas found some single bones of an ox and a horse; an earthen boiling vessel, crushed among the rubbish; some remains of a crooked piece of wood; and a round piece of leaf-gold bent over a raised copper button.

MISCELLANEOUS CURIOSITIES.

One of the noblest monuments of veneration for the memory of Peter the Great is an equestrian statue of that monarch, cast in bronze by M. Falconet, at the expence of the late empress, and erected in the area before the palace at Petersburgh. The pedestal, on which it stands, is a stupendous mass of reddish granite, which was discovered, half buried in a morass, at some distance from the city. The morass was drained, and a road cut through a forest in order to get it out; and although it weighed one thousand five hundred tons even after it was reduced, it was drawn, by a windlass and large friction balls placed in grooves on each side of the road, to the banks of the Neva. It was then embarked in a vessel which had been purposely constructed for its reception, and conveyed to the place where it now stands.

When landed at Petersburgh, this pedestal was

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forty-two feet long at the base, thirty-six at the top, twenty-one in thickness, and seventeen in height. A bulk greatly supassing in weight the most boasted monuments of Roman grandeur. Here, however, we must observe, that this truly curious rock does not now retain its original dimensions; as, in forming a proper station for the statue, and representing an abrupt broken precipice, its bulk has been necessarily diminished.

The statue is of colossal size, and represents the monarch in the act of mounting a precipice, the summit of which he has nearly attained. He appears in a loose Asiatic vest, seated on a bear-skin housing, and crowned with a wreath of laurel; his left hand holds the reins, and his right is extended, as in the act of blessing his people. The horse is rearing on his hind legs, and his flowing tail slightly touches a bronze serpent, artfully contrived to assist in supporting the ponderous statue in due equilibrium. The simplicity of the inscription, "CATHERINE II. TO PETER I." is perfectly correspondent with the sublimity of the design, and, as a celebrated traveller has observed, "it is far preferable to a pompous detail of exalted virtues, which the voice of flattery applies to every sovereign without distinction.

This beautiful statue was erected on its pedestal in the year 1782, and the ceremony was performed with equal pomp and solemnity. At the same time an imperial proclamation was issued, to pardon all criminals under sentence of death; all convicts, excepting murderers, condemned to hard labour; and all deserters who should return to their duty within a limited time.

Within the fortress of Petersburgh is a four-oared boat, which is carefully preserved as a

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memorial to future generations of its being the origin of the Russian fleet. Peter I. gave it the name of *Little Grandsire;* and in the latter part of his reign it was conveyed in solemn procession to the capital, in order to excite the admiration of the people, and to inspire them with sentiments of veneration for a prince who had made such astonishing improvements in the marine.

In the Academy of Sciences, in the same city, is a repeating watch, about the size of an egg; within is represented our Redeemer's tomb, with the stone at the entrance, and the centinels upon duty; and while a spectator is admiring this curious piece of mechanism, the stone is suddenly removed, the centinels drop down, the angels appear, the women enter the sepulchre, and the same chant is heard which is performed in the Greek church on Easter-eve.

The extraordinary genius who contrived this watch is a common Russian peasant, and possessed of but little knowledge in the theory of mechanics. It appears, from very respectable authority, that he was apprenticed to a shop-keeper, at Nishnei-Novogorod, and that, in this situation, his curiosity was strongly excited by a wooden clock, which was fixed opposite to his dwelling. After reiterated examinations he comprehended the nature of the internal structure, and, without any assistance, formed one exactly similar in materials and proportion. The success of this attempt emboldened him to undertake the construction of metal clocks and watches; and the subsequent exertions of his native genius induced the late empress to take him under her protection.

Mr. Coxe informs us, that this self-taught artist has projected the sublime plan of throwing a

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wooden bridge, of a single arch, across the Neva, although the stream in the narrowest part is nine hundred and eighty feet broad. His plan is to form the bridge by four frames of timber, two on each side, composed of various beams or trusses, which are to support the whole machine; the road, instead of being carried over the top of the arch, is to be suspended in the middle, and the structure is to be roofed at the top, and covered at the sides. According to the computation of the projector, this bridge would require 12,908 large trees, 5,500 beams to strengthen them, and 48,650 iron nails; and the expence of its erection would amount to three hundred thousand roubles, or sixty thousand pounds sterling. He is perfectly convinced of the practicability of this scheme, and the admired writer from whom we have extracted the substance of this account seems of the same opinion. But whether the execution of so stupendous a work be deemed possible or not, the model is certainly worthy of attention, and reflects the highest honour on the inventive faculties of an unimproved genius. The model is ninety-eight feet long, and is constructed with such uniform solidity, that it has supported one hundred and twenty-seven thousand four hundred and forty pounds; which is far more, in proportion to its size, than the projected bridge would have to sustain from its own weight and the additional pressure of carriages.

In one of the apartments belonging to the Academy of Sciences is a waxen figure of Peter I. sitting in an armed chair, and clothed in the same dress * which that emperor wore when he placed

* This is a suit of blue silk richly embroidered with silver; the stockings are of flesh-coloured silk, with silver clocks.

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the diadem upon the head of his beloved Catharine. The height of this figure is rather more than six feet; the eyebrows and hair are black, the eyes dark, the complexion swarthy, the aspect ferocious, and the head inclined to one side, according to his usual custom. Indeed the features may naturally be expected to bear a striking resemblance to the original, because they were taken from a mould applied to his face when dead, and coloured in imitation of his real countenance.

In the same room are preserved the plain blue uniform and brass hilted sword worn by Peter at the battle of Pultava; the hat used on the same occasion, which was pierced near the crown, by a musket ball; and the trowsers, worsted stockings, shoes and cap, which he wore in the dock-yard of Sardam under the character of Master Peter. The academy of Sciences have also evinced their veneration for the memory of this illustrious character, by preserving in their museum the horse which he rode at the battle of Pultava, two favourite dogs, his turning lathe and tools, and several specimens of his workmanship.

Among a variety of other interesting curiosties which are contained in this museum, we must notice a large mass of iron, consisting of that metal in its native state blended with glass like matter: it is in all respects perfect, malleable, capable of being forged into any form, and evidently partaking of all the qualities of iron.

The following account of this truly interesting object was given to Mr. Coxe by professor Pallas, who discovered the mass during his travels in Siberia.—"This mass, which exhibits the first instance of native iron ever found in a state of per-

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fect malleability, was discovered upon an eminence between the rivulets Oberi and Sisim, which fall into the river Yenisei above the town of Krasnoyarsk. It was a separate mass, seemingly detached, by lapse of time, from the mountain upon which it rested; and what is very remarkable, the chain of mountains among which it was found, do not afford the least traces of any volcano, forge, or ancient mine, or, in any other part, the smallest appearance of native iron.—A rich vein of bluish magnetic ore excited the attention of the Russian miners, and first led to the discovery of this insulated mass.

"The mass, in its original state, weighed one thousand four hundred and forty English pounds, and was incrusted in most parts with a thick coat of blackish iron ore. The inside consists of pure malleable iron, divided by irregular cavities, which are filled with a vitrified transparent substance, yellow for the most part, but black in a few places near the surface, and partially blended with ochre.

"Persons who have never seen any part of this mass may be disposed to think that it must have been the effect of art; but whoever examines it with attention must be convinced that it is entirely natural, although they may not be able to account for the mode of its production."

The great bell of Moscow, cast at the expence of the empress Anne, is at once a monument of art and folly; but it seems that it has always been esteemed a meritorious act to present a Greek church with bells, and that the piety of the donor was measured by their magnitude. The height of the bell here alluded to, is nineteen feet, its circumference at the bottom sixty-three feet eleven

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inches, its greatest thickness twenty-three inches; and its weight upwards of four hundred and thirty-two thousand pounds. The beam to which it was fastened being accidentally burnt, this enormous bell fell down, and a fragment was broken off towards the bottom, which left a chasm large enough to admit two persons abreast without stooping.

In the middle of the Khitaigorod, at Moscow, is an ancient gateway, forming an entrance into the printing-office of the holy Synod. It is of curious workmanship, and ornamented with figures of the lion and unicorn, grotesquely carved in wood. From this decoration some authors have conjectured, that the gateway was the entrance to the hotel, constructed, during the reign of Ivan Vassiliovitch II. for the residence of the English ambassador; and that the czar Alexey converted the hotel into a printing-office, whilst his anger was inflamed against the English nation by the execution of Charles I. These opinions, however, appear to be very ill-founded; as the ambassador's hotel was situated in another part of the Khitaigorod, and an inscription over the gateway denotes, that Michael Feodorovitch and his son Alexey, caused these apartments and this gate to be constructed in the printing-house in 7152, or according to our era, 1645; a convincing proof that the printing-house was established prior to the martyrdom of Charles I. and therefore could have no reference to that event.

The ice hills about Petersburgh are exceedingly curious, and afford a perpetual fund of amusement to the populace; they are constructed in the following manner:—A scaffolding is raised upon the river about ten yards in height, with a landing place on the top, from which a sloping plain

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of boards, about twelve feet broad and ninety long, descends to the superficies of the river. Upon these boards are laid square masses of ice, three or four inches thick, which, being smoothed with an axe and sprinkled with water, adhere firmly to the boards, and form an inclined plain of pure ice. From the bottom of this plain the snow is cleared away, and the sides and top of the scaffolding are ornamented with firs, pines, &c.

Each person who chuses to partake of the diversion, ascends by a ladder to the summit; seats himself upon a sledge something like a butcher's tray; and suffers it to glide rapidly down the inclined plain, carefully poising it as he goes along. At the end of the first course is another ice-hill in a parallel direction; so that the person immediatly mounts again and glides down the other plain of ice. This diversion is sometimes continued for a considerable time, the sledges following each other with inconceivable rapidity. The only difficulty in this pastime consists in steering and balancing the sledge as it is hurried down the inclined plain; for if the person in it does not sit steady, but happens to totter, either through fear or inadvertency, he is liable to be overturned, and is in imminent danger of breaking his limbs. These ice-hills exhibit a very interesting appearance on the river, as well from the trees with which they are ornamented, as from the various objects which, at particular times of the day, are sliding down without intermission.

The market upon the Neva is so extremely curious in its nature as to demand peculiar attention.—At the conclusion of a long fast which terminates on the 24th of December, O. S. an annual market is held, for three days, upon the

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Neva; that the Russians may be enabled to lay in provisions for the remaining part of the winter.—A long street is lined on each side with many thousand carcases of oxen, sheep, hogs, and pigs; together with geese, fowls, game, and every species of frozen food. The larger quadrupeds are grouped in various circles, their hind legs being fixed in the snow, and their heads turned toward each other. These, being placed upright, tower above the rest, and occupy the hindermost row: next succeeds a regular series of animals, descending gradually to the smallest; these are intermixed with game and poultry, hanging in festoons; and the whole is prettily garnished with heaps of fish, butter, and eggs.

This immense store of provisions is brought from very distant parts of the empire, yet every article is remarkably cheap.—In order to render this frozen food fit for use, the Russians thaw it in cold water.

Another curious market is held in the suburbs of Moscow, and exhibits a variety of *ready-made houses*, strewed upon the ground. A person wanting a dwelling, repairs to this spot, mentions the number of rooms he requires, examines the different timbers, and bargains for that which appears to suit his purpose Sometimes the house is paid for upon the spot, and carried away by the purchaser: but it frequently happens that the vender engages to transport it to the place where it is designed to stand. An English reader may deem it incredible that a house may be thus purchased, removed, erected, and inhabited within the space of five or six days; but he may convince himself of its practicability, by considering that these ready-made dwellings are merely collections

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of trunks of trees tenanted and mortaised at each extremity; so that nothing more is required than the labour of removing and erecting them.

ARTS, MANUFACTURES, COMMERCE, &c.

PETER the Great spared neither trouble nor expence to dispel the clouds of ignorance, which, till his time had overspread the Russian empire, and to inspire his subjects with a taste for the arts and sciences: he founded an university, a seminary, and an academy of sciences, at Petersburgh, besides other schools in the different parts of his empire; invited persons of learning, and skill in the arts, to settle in his dominions; and encouraged his subjects to travel where the arts and sciences flourished. Hence persons of genius among the Russians have cultivated their minds, and make some figure in the republic of letters; but as there are only three universities in that vast empire, literature may be said to be yet only in its infancy, and the number of the learned Russians is comparatively but small: the studies to which they chiefly apply themselves are history, geography, and the mathematics.

The members of the academy of sciences at Petersburgh, not only publish their own memoirs, but compose a variety of books for the instruction of youth, and make translations of the most useful works published in foreign countries. All the mechanic arts and trades are also continually improving in Russia. These were begun by foreigners; but the natives, spurred on by emulation, frequently equal, and sometimes exceed their

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teachers. They have some flourishing manufactures of velvet, silk, linen and woollen stuffs; and they work in copper, brass, iron, steel, and tin.—Cannon, muskets, gunpowder, wire, paper, parchment, glass, cordage, and sail-cloth, are also made in Russia; but most of them are inferior to those imported from other countries.

For several years past, Russia has made very rapid strides in the improvement of her commerce; prudently availing herself of the advantages of those rivers which open a communication with almost every part of the globe, and particularly within her own extensive dominions.

It seems to be a maxim, established in all countries where commerce has made any considerable progress, that the value of exports should exceed that of imports, to prevent the necessity of the balance being paid in money. The Russians, therefore, have taken the most vigorous measures to prohibit the exportation of their coin, and (notwithstanding they are in possession of both gold and silver mines) neither plate nor bullion can be carried out of the country but by express permission. In the commerce between Russia and England, the balance of trade is greatly in favour of the former.

At Petersburgh there is an English factory, which was established in the reign of Mary I. and half the trade of the city is carried on by our countrymen; yet the Russian trade in the Baltic is also carried on with great spirit at Riga, Revel, Narva, and Wiburgh. Here it is proper to observe, that although the English enjoy so large a share of the Russian trade, there are no monopolies nor exclusive privileges assumed by the Russian company; for any natural-born subject may,

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at a small expence, take his freedom of the company; establish a house of business under protection of the British crown; and send Russian goods into England, paying the legal duties.

The principal articles exported by the Russians to Persia, are English, Dutch, French, and Siberian cloths; vitriol, alum, sugar, red leather, coarse linen, velvets, glass-ware, paper, furs, hardware, watches, &c. for which they receive raw and manufactured silks, curled lamb-skins, rice, spices, sulphur, naptha, pearls, and precious stones.

With the Bucharians, who are a very commercial people, inhabiting the south-western part of Independent Tartary, the Russians trade largely; but the Chinese trade, carried on at Kiachta, and situated on the frontiers of the empire, is the most important of all their Asiatic commerce, and is said to amount to eight hundred thousand pounds per annum. The late empress promulgated an edict, permitting all foreigners to carry on a free trade, by sea and land, with all the countries bordering on the Euxine, which have been lately annexed to the empire.

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CHAP. XIII.

OF TURKEY IN EUROPE.

Caverns, Springs, Volcanic Islands, Remarkable Tides, &c.

THIS part of the Turkish empire was formerly the most considerable of the European continent, and was inhabited by nations who make the greatest figure in ancient history. The valour, wisdom, and learning of the Greeks in particular, are well known to all who have any acquaintance with the affairs of antiquity, their country being once the most celebrated in the universe, and themselves surpassing all their contemporaries in arms, arts, and scientific knowledge. Greece was, for many ages, divided into small kingdoms and republics; but these were reduced, after many desperate struggles, under the arms of the Macedonians, and were afterwards provinciated by the Romans, to whom they continued subject till they were dismembered by the Goths and Huns, and eventfully subjugated by the Turks, who are their present masters.

We have already described, in the course of this work, several remarkable caves or grottos; but no curiosity of this kind is more deserving of attention than a subterraneous grotto in the island of Antiparos, in the Archipelago. It was first discovered by an Italian traveller named Magni, to whom we are indebted for the following account:

"Having been informed," says our author, "that in the island of Antiparos a gigantic statue

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was to be seen at the mouth of a cavern, it was resolved that we (the French consul and himself) should pay it a visit. Accordingly we landed on the island, and walked about four miles over some beautiful plains and sloping woodlands, till we came to a little hill, on the side of which yawned a cavern, whose terrific gloom almost repressed our curiosity. After a moment's pause, however, we entered; and had not proceeded above twenty paces when we perceived that the supposed statue of a giant was, in reality, nothing more than a sparry concretion, formed by water dripping from the roof of the cave, and gradually hardening into a figure, which the fears of the country people had formed into a monster.

"Incited by this extraordinary appearance, we determined to penetrate farther, in quest of new adventures; and as we proceeded, new wonders presented themselves to our contemplation: the spars, formed into a variety of trees and shrubs, exhibited a kind of petrified grove, some white, some green, and all receding in due perspective. Our amazement was much increased by considering that these objects were mere productions of nature, who had, in her playful moments, decorated the scene for her own amusement. But we had hitherto seen but a few of the wonders of the place, and were only introduced into the portico of this stupendous temple.

"In one corner of the half illuminated recess, we discovered an opening about three feet wide, which seemed to lead to a place totally dark, and which our guide assured us contained nothing more than a reservoir of water. Upon this we threw down several stones, which rumbled along the descent for some time, and at length seemed to

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fall into a bed of water. But as we were anxious to gain more satisfactory intelligence, we prevailed on a Levantine mariner to light a flambeau, and explore the narrow aperture. After continuing within it for about a quarter of an hour, he returned, holding some beautiful pieces of white spar in his hand, and informing us, that the place was full of similar incrustations.

"We now ventured to follow him for about fifty paces, cautiously descending by a steep and dangerous path; but on approaching a precipice which led into a sort of amphitheatre, we returned for a ladder, flambeaux, and other things to expedite our descent. We then went down into the most magnificent part of the cavern, and, having lighted a number of candles, were entertained with a most glittering and interesting scene. The roof was hung with beautiful icicles, transparent as glass, yet solid as marble; the sides were regularly formed with spars; the floor consisted of solid marble; and in several places were representations of magnificent columns, thrones, altars, and other objects, as if nature had designed to mock the richest works of art.

"In the midst of this splendid amphitheatre rose a concretion of about fifteen feet high, which bore so striking a resemblance to an altar that we caused mass to be celebrated there. The beautiful columns that shot up round this altar appeared like candlesticks, and many other natural objects represented the customary ornaments of a church. Our voices, upon speaking or singing, were increased to an astonishing loudness, and the reverberations which followed the firing of a gun were almost deafening.

"Below this spacious grotto there appeared

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another cavern, into which I descended about fifty paces, by means of a rope, and at length arrived at a small spot of level ground, where the bottom consisted of a soft clay, and easily yielded to my pressure; but here, as in the upper cave, were a variety of beautiful crystalizations, one of which particularly resembled a table.—Upon our egress from this stupendous grotto, we perceived a Greek inscription upon a rock at the entrance, but the characters were so obliterated by time that it was utterly impossible to decypher them."

From this account M. Tournefort varies in many particulars; for whereas Magni mentions only one abrupt descent or precipice from the entrance to the most magnificent part of the grotto, the other gentleman asserts, that there are many dangerous precipices and rugged ways, through which a visitor must sometimes creep on his belly. He likewise informs us, that the Greek inscription, near the entry, contains a number of proper names; and that there is a tradition among the neighbouring peasants, that these are the names of some persons who conspired against Alexander the Great, and afterwards fled for refuge to this sequestered retreat.

The most particular account of this grotto, however, that has hitherto been published, appeared in the British Magazine in the year 1746, which, as it seems to bear strong marks of authenticity, we shall insert for the entertainment of our readers.

"The entrance," says the writer of this article, "lies in the side of a rock, about two miles from the sea-shore; and is a very large arch, formed of rough craggy rocks, overhung with brambles and climbing plants that give it an air of awful gloominess. Our surgeon, myself, and four other

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persons, attended by six guides with lighted torches, entered this cavern about eight o'clock in the morning, in the middle of August.—We had not proceeded twenty yards when we lost all sight of day-light; but the roof and sides of the alley through which we were passing, glittered like diamonds by the reflection of our torches. At the end of this passage we were presented with ropes to tie about our middles, which when we had done, our guides led us to the brink of a most terrific precipice. The dreadful depth of this place and the horror of a descent through a miserable darkness, made me look back to the lane of diamonds we had just passed; but the hope of seeing something curious at the end of my journey tempted me to lower myself down by a rope as the guides directed.—After reaching the bottom, and congratulating my friends on our safe descent, I enquired for the grotto; but our guides told us we had a great way to go yet; and they immediately led us forward, under a ridge of rugged rocks, to the brink of another precipice, much deeper and more terrible than the former. Two of the guides now preceded us with torches; and by their light we could discern that this passage was not so perpendicular as the other, but lay in a steep slant, with a very slippery rock for the bottom; vast pieces of rock jutting out on one side in the descent, and forcing the guides sometimes to creep under, sometimes to climb over, and at other times to go quite round them; whilst a series of dark caverns, like so many monstrous wells, yawned on the opposite side, ready, if a man should slip, to swallow him up for ever.

"We stood some time on the edge, to watch

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the motions of our guides; and were equally amazed and terrified to see them descend before us until they seemed at a most frightful depth. On their calling to us from the bottom, we began to descend after them; but we had not gone thirty feet down when we came to a place where the rock was perfectly perpendicular, and a vast cavern seemed ready to swallow us on one side, while a wall of rugged rock threatened to crush us on the other.—At this terrible prospect I was quite disheartened, and declared I would proceed no further; but as the guides assured us there was no danger, and my companions resolved to see the bottom, I proceeded to a corner where was placed an old ladder, and by this we all descended.

"Having surmounted this difficulty, we found ourselves at the entrance of another passage, which, as we slid down, appeared to be about nine feet high, and seven wide, and to have for its bottom a green glossy marble. The walls and arched roof being as smooth as if wrought by art, and composed of a glittering red and white granite, supported with red porphyry, made a most splendid appearance. When we entered this passage I expected that we should, at the bottom, join the two guides we had first set down; but alas! when we got there we found ourselves at the mouth of another precipice, which we descended by a second ladder not much better than the former. The dread of falling employed all my thoughts during this descent; but I observed, as my companions were coming down after me, that the wall to which the ladder was fastened, was a solid mass of red marble, covered with white sprigs of rock crystal, and making, with

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the glow of the purple from behind, one immense sheet of amethysts.

"After sliding, about twenty feet, through another shallow vault of green and white marble, and refreshing ourselves with a little rum, we proceeded through a slanting passage of rough coarse stone, full of figures of snakes rolled round, and seemingly alive; but in reality as cold and hard as the rest of the stone. When we had walked about two hundred yards down this descent, we saw two beautiful pillars, of a glittering yellow marble, which seemed formed to support the roof; and soon afterwards we descended another precipice, which the guides assured us was the last.

"At the bottom of this precipice, we found ourselves, for some way, upon plain even ground; but after walking about forty yards, we entered an alley, the sides and roof of which were entirely composed of black stone, and the rocks were in some places so steep and rugged, that we were forced to slide down on our backs, and were bruised miserably in passing. Over our heads were nothing but dismal rocks, some of which threatened to fall in upon us, and the light of our guides' torches only served to show the surfaces of some dirty lakes of water.

"If I had repented of my expedition before, I now gave myself over for lost; bitterly accusing all the travellers who had given such a description of the place as excited people's curiosity, without warning them of the horrors that lay in the way. —In the midst of these sad reflections we lost four of our guides, and as the place was now much darker for want of their torches, I expected to follow them into some of those lakes where I supposed they had inevitably perished,

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although the two remaining guides assured us that we should soon meet their companions again, and that we were very near the end of our journey.

"Our passage was now become extremely narrow, and we were obliged to crawl on our hands and knees over the rugged rocks, when, in an instant, I heard a hissing noise, and found myself in total darkness. The guides told us they had accidentally dropped their torches in a puddle of water, but exhorted us to crawl forward, and told us there was no danger. I was, indeed, astonished at the courage of these men in a place where I thought four of them had already perished; but as I thought it impossible for any of us to escape from our present situation, I determined to lie down and die where I was. One of the guides, however, immediately came up to me, and, clapping his hand firmly over my eyes, dragged me a few paces forward. Whilst I was in this strange situation, expecting death in a thousand shapes, and trembling at the rough behaviour of my conductor, he suddenly lifted me over a great stone, set me on my feet, and removed his hand from my eyes. But what language can express my transport and astonishment at that moment, when, instead of darkness and despair, all was splendor and magnificence before me? my friends all appeared about me; the place was illuminated by fifty torches; and all the guides welcomed me into the Grotto of Antiparos. I now found that the four men whom I had deemed lost, had given us the slip, in order to get the torches lighted before we came; and the other two had wilfully put out their lights, that we might enter out of utter darkness into this pavilion of splendor and glory.

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"The grotto in which we now were, is a hundred and twenty yards wide, a hundred and thirteen long, and about sixty yards high. These dimensions are somewhat different from those which travellers have generally presented to the public; but they are certainly accurate, for I took them with my own hand. Imagine, then, an immense arch like this, lined with crystallized white marble, and illuminated by fifty torches, and you will have some idea of the place in which I spent three hours.

"The roof, which is a fine vaulted arch, is hung all over with icicles of white marble, some of them ten feet long and as thick as a man's waist; and from these depend a thousand festoons of leaves and flowers of the same substance, but so extremely glittering that it is impossible to look upon them without dazzling one's eyes. The sides of the arch seem planted with trees of white marble, rising in rows above each other; from these are hung beautiful festoons, tied, as it were, from one to another, in prodigious quantities; and in some places there actually seem to be rivers of marble, winding in a thousand elegant meanders.—All these things have been made, in a long course of years, by the dropping of water, but they really look like trees and brooks transformed to marble.

"The floor was rough and uneven, with red, blue, green, and yellow crystals growing out of it in an irregular manner: these were all shaped like pieces of salt-petre, but so hard that they cut our shoes; and among them are placed icicles, or small pillars of white shining marble, to each of which our guides fastened two or three torches. All round the sides of the arch are white masses

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of marble in the shape of oak trees, and sufficiently large, in many places, to inclose a piece of ground big enough for a bedchamber. One of these chambers has a beautiful curtain, whiter than sattin, of the same marble, stretching entirely over the front, on which we all cut our names, and the date of our visit, as many other persons had done before us."

In the district of Catholicos, at Cape Melecca, is a spacious grotto, running horizontally into the bosom of a mountain, near the monastery of St. John. An infinite number of stalactical pillars of various forms and large dimensions, seem intended for supporting the roof; and in the intermediate spaces are found other masses of a similar nature, having been formed, in a series of years, by a slow filtration of waters through the roof, and by the stony substances which these waters have carried with them. Among these stalactites may be seen some curious resemblances of porticos, heads, slender tubes, and other figures, whose number and variety produce a very agreeable effect.

The general colour of the stalactites in this grotto is yellowish and opake; but some are found of such dazzling whiteness, that their beauty surpasses the finest alabaster. Although extremely hard, these stalactites easily break; and on striking them with a hammer they emit sparks, which are supposed to be produced by the vitreous particles blended with the calcareous substances of which they are composed.

M. Sonnini observes, that on his visiting this place in the month of June, he found the air extremely sharp in the grotto, although the weather was very warm; but on repeating his visit in

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November, he experienced quite the reverse; for he felt a powerful heat within the cave, while the atmosphere was remarkably cool. A guide and flambeau are absolutely necessary to strangers who wish to explore this natural excavation, as they might otherwise be in imminent danger of falling headlong into some dark abyss.

In the same district is another remarkable cavern, the arched roof of which is very lofty, but of no great depth. Just within the entrance is a most striking resemblance of a bear, formed by a large block of stalactite; and Pocock affirms, that there were, at the time of his visit, several stalactical figures of hunters, who seemed to attack the bear; but these figures have probably been destroyed, as no vestiges of them now remain.

On the declivity of a mountain which forms the head of the haven of Prase, are some grottos dug in the rock. The largest has a very wide entrance, its interior is spacious, and its extremity is walled up. The Greeks are ignorant for what use these excavations were designed; but they say, that the wall in the large grotto was constructed in order to close the openings of some subterraneous galleries, which extend to a very considerable distance; and to prevent the flocks which commonly shelter in these caverns, from penetrating too far, and being lost.

At some distance from the harbour of Milo are several subterraneous galleries which appear very deep, and the descent into some of them is by a winding flight of steps. Along the staircase are several small recesses, cut in the stone, which seem to have been intended for the reception of lamps for lighting these gloomy places, as they were, in all probability, consecrated to the sepul-

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ture of the Miliots. To penetrate into them, at present, is a very laborious task; the passage being almost entirely filled up with heaps of stones.

Opposite to these are some other catacombs, but neither so large nor so deep as the former. On entering them, after having walked for a few moments on an inclined plain, you meet with some wide steps, leading into a spacious hall: at the farther end is a sort of bench cut in the rock, and round it are several small rooms.

The entrance of this cave is in a mass of stones entirely calcined; they are light and spungy, like those of the surrounding rocks, long exposed to the action of an immense fire, which all the efforts of man could not extinguish. In short, they present on a smoking island, whose soil rests on vast burning furnaces, the image of combustion, and the symptoms of some considerable convulsion.

At the distance of half a league from the town of Milo, there is a natural bath, formed by a spring of boiling water. Buildings were formerly constructed round this spring, for the accommodation of invalids, who came hither from all quarters; but these have shared the fate of every thing beautiful and useful that have fallen into the hands of the Turks. There now remains only a little arched gallery with a stone bench, that may serve as a seat for a single person; and it is impossible to sit there without experiencing a most suffocating heat. The water which forms this bagnio, runs under ground toward the shore, and is found again beneath the sand of the harbour, where it exhales a sulphureous smell, deposits an ochre-coloured sediment, and is seen to bubble up

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from the bottom of the sea, at the distance of ten or twelve feet from the beach.

To the north of this bath is a curious excavation, formed in a rock of a consistence remarkably light and almost friable, at the extremity of which is a small lake of hot water; but its depth does not exceed four feet, and its heat is sufficiently moderate to admit of a person bathing. The sides of this cavern are entirely covered with a thick coat of nitre, which is formed there naturally.

In the same neighbourhood M. Sonnini observed an aperture in the ground, whence issued vapours of so destructive a quality, that by placing an animal at the vent-hole, it fell dead on the spot: some persons, equally rash and ignorant, attempted to descend into it, and, in consequence, lost their lives. By the advice of M. Choiseul Gouffier, the inhabitants of Milo stopped up the mouth of this chasm, but the deleterious miasmata has found some other issue, and the atmosphere is still filled with noxious exhalations.

The hot and smoking waters of Argentiera, which issue from a rock on the north-west part of the island, still attest the existence of a subterraneous fire in full activity. Their heat is so powerful that a person cannot possibly hold his hand in them, and in an instant eggs are boiled hard. They deposit a sediment like yellow-ochre; their flavour is of an extreme tartness; and when cooled they assume a whitish tint.

The Greeks assert, that these thermal waters are very efficacious in curing rheumatism, sciatica, and other disorders of a similar nature, by applying them to the part affected. "I have been told, says Sonnini, "of the wonderful effects of these applications, and I have had no difficulty in

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believing them, as the waters of Argentiera must certainly be very active. Indeed, I do not know whether the method of partial applications which are made of them be not more efficacious than total immersion, or bathing, as prescribed by our physicians. Long experience, and tradition which is, perhaps, as old as the times when physicians more full of observation than learning, dictated, in ancient Greece, rules, from which sound practitioners are still afraid to deviate, have probably taught the modern Greeks the method of employing thermal waters as a topical application rather than the bath."

The place where these waters of Argentiera are situated, affords no accommodation for the invalids who may wish to go thither. The visitor arrives there by a very difficult road; he finds no shelter from the heat of the sun; nor is there a space sufficiently level for a few persons to sit down; the whole district consisting of prominent and pointed rocks. It is very remarkable, that all the stones of the environs are encrusted with a bluish mineral substance, which exhibits a very singular appearance.

In Candia, the ancient Crete, a large island in the Mediterranean, there is a subterranean maze or labyrinth *, which pervades the whole inside of a hill at the foot of mount Ida, three miles from the ruins of Goatyna. The entrance of this labyrinth is seven or eight paces broad, but so low;

* The reader must not imagine, that this is the famous labyrinth built by Dœdalus for Minos king of Crete, which appears from antique medals to have been at Gnossus, at that time the capital of the island, but now an inconsiderable village. Diodorus Siculus and Pliny tell us, there was not, in their days, the least vestige of that labyrinth remaining.

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that a man cannot pass it without stooping. The bottom of it is extremely rough and uneven, but the roof is flat, being formed of beds of stone lying horizontally one upon another. Proceeding forwards through a sloping cavern, we soon meet with innumerable turnings and windings, so irregular and intricate, that if any person happen to strike into one of them out of the main path or alley, he is in great danger of being bewildered and lost. To prevent this, strangers seldom deviate to the right or left, but keep along the principal alley; and to find the same way back again the more easily, they scatter straw on the ground, stick up bits of paper at every turning, or take some other precaution of that nature.

The chief passage is about seven feet high, and the greatest part of it is wide enough for three or four persons to walk a-breast; but in some places a man must stoop a little, and in one part he is obliged to creep upon his hands and knees to get along. It is near a mile from the entrance to the end of the labyrinth, where the walk divides itself into two or three branches, and terminates in circular rooms cut out of the rock, in which strangers rest themselves with pleasure.

Belonius, and some other authors, have imagined, that this wonderful labyrinth was originally a quarry, out of which stones were dug for the building of Gnossus and Gortyna; but M. Tournefort, who thoroughly considered the matter, gives several strong reasons against such an hypothesis. He thinks it much more probable, that it was at first a natural cavity, which some persons had the curiosity to enlarge, by widening the passages, and taking down some strata of stone to heighten the roof; for the Cretans, he ob-

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serves, were a polite people, devoted to arts as well as arms, and took delight in perfecting the rude sketches of nature.—There are several other natural openings in the neighbouring mountains, and abundance of caverns in the rocks throughout the island, which seem to confirm this conjecture.

Here it may be proper to give some account of a new island which rose up near the island of Santerini from the bottom of the sea towards the beginning of the last century. This however is not the first prodigy of that kind which has appeared near Santerini, for the Great and Little Burnt Island (as they are called) were both raised out of the sea in the same manner, the first about two hundred years before the birth of our Saviour, the latter in the year 1573; and Asproneśi, or the White Island, which emerged in the time of Vespasian.

All this was occasioned by violent earthquakes and subterraneous fires; and from the same causes we imagine have proceeded those showers of ashes which have been observed to fall in the Archipelago and the Mediterranean; for several extraordinary phenomena of this kind, which have been looked upon as preternatural and ominous accidents, have, upon strict enquiry, been found owing to natural causes. Thus a shower of blood was once thought to have fallen in France, which so frightened the country people, that they left their work in the fields; but M. Peiresco, after a careful examination, found it was only red drops coming from a sort of butterfly which then flew about in great numbers.

During a scarcity in Silesia, a rumour was spread of its raining millet-seed; but upon exa-

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mination; it proved to be the seed of the ivy-leav'd speedwell, or small henbit, which grew there in great abundance. So likewise about Warminster in Wiltshire, it was reported to have rained wheat; but Mr. Cole found it to be only ivy berries, blown thither in a considerable quantity by a tempest; and this agrees with Dr. Merret's observation, that the pretended showers of wheat are nothing but ivy-berries, swallowed and voided again by starlings and other birds.

Some persons have asserted the raining of young frogs, small fishes, &c. which Dr. Derham supposes may be transported by tempestuous winds (though they may have some other conveyance), especially considering to what distance, and in what quantities, the sea-water was carried in the great storm in 1703, of which he had the following accounts from a friend in Sussex: That a physician travelling soon after the storm, about twenty miles from the sea, plucked some twigs from the hedges, and chewing them, found them to be salt; that the grass of the Downs about Lewes was so salt, that the sheep would not feed till compelled by hunger: and that a miller, with his man, attempting to secure his mill, which was three miles distant from the sea, were so washed by flashes of sea-water, like the breakings of waves against the rocks, that they were almost strangled with it, and forced to give over their attempt.

In the year 1650, the shocks of an earthquake near Santerini were accompanied with a roaring noise under ground, sulphureous exhalations, an intolerable stench, and a black smoke, which rose out of the sea, mixed with flames, to a considerable height. The sea was then tossed back-

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wards and forwards in such a manner, that it overflowed and destroyed thirty thousand perches of land, and the air was so infected with exhalations from the fire, that twenty-five persons, and a great many beasts, were stifled. At length, when the force of the fire and earthquake had raised up a mass of earth and stones within eight or ten fathoms of the surface of the sea, a vent being opened on a sudden, the water rushed in like a torrent, and extinguished the fire, and thereby prevented the appearance of another island.

History affords several other instances of the surprising effects of these concussions of the earth near Santerini, and particularly M. Thevenot relates, that about the year 1638, a prodigious quantity of pumice-stones was cast up from the bottom of the sea, with such noise and roaring as resembled the discharge of artillery; insomuch that the inhabitants of Scio, which is above a hundred miles distant, imagined the Venetian and Turkish fleets were engaged. The air was likewise so filled with noxious exhalations, that many people died in Santerini, and the silver in men's pockets or chests was tarnished, even at the distance of Scio and Smyrna.—But we proceed to an account of the last new island that appeared in the Bay of Santerini, as given by F. Goree, who was an eye-witness of its formation.

On the 23d of May, 1707, after an earthquake that happened the night before, a new island was discovered early in the morning by some seamen, who, not being able to distinguish what it was, and taking it for some wreck brought thither in the night-time, rowed immediately towards it; but finding a heap of rocks and earth, instead of

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a floating wreck, they hastened back again, and spread the report over Santerini.

The inhabitants were utterly confounded at the first sight of this phenomenon, but their surprise abated in a few days, and seeing no appearance of fire or smoke, some of them ventured to go ashore upon the new island. Their curiosity led them from one rock to another, where they found a sort of white stone that cut like bread, and very much resembled it in form, colour, and consistence. They also found great numbers of oysters adhering to the rocks, but whilst they were employed in gathering them, they perceived the island shake under their feet, upon which they retired to their boats with the utmost precipitation.

With these motions and tremblings the island every day increased, not only in height, but also in length and breadth; though now and then it happened, that whilst it was raised and extended on one side, it sunk and diminished on the other. F. Goree observed a rock rise out of the sea, about forty or fifty paces from the island, which continued four days together, when it sunk again and appeared no more; but several others appeared and disappeared alternately, which at last remained fixed and unmoved. During this time, the colour of the surrounding sea was changed, being at first of a light green, then reddish, and afterwards of a pale yellow, accompanied with a noisome stench, which spread itself over great part of Santerini.

The smoke appeared first on the 16th of July, not indeed from the island itself, but from a ridge of black stones which suddenly rose up about sixty paces from it, where the depth of the sea was before unfathomable. Thus for some time there

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were two separate islands, one of which was called the White, and the other the Black Island, by reason of their different colour; but after some time they united in such a manner, that these black rocks became the centre of the whole island. The smoke issuing from them was very thick, and of a whitish colour, like that of a lime-kiln; which, being driven by the wind towards Santerini, penetrated many of the houses, but without doing any particular mischief.

In the night between the 19th and 20th of July, flames were observed to issue with the smoke, to the great terror of the inhabitants of Santerini, especially those of the castle of Scaro, who were not above half a league distant from the volcanic island. This island now increased very fast, large rocks daily springing up, which added sometimes to its length, sometimes to its breadth, insomuch that the additions from time to time might easily be perceived. The smoke also increased very considerably, and ascended so high as to be seen at Candia, Naxos, and other distant islands. During the night it appeared like a column of fire, fifteen or twenty feet high; and the sea at that time was covered in some places with a red or yellowish froth, whence proceeded such a stench over the whole island of Santerini, that the inhabitants were obliged to burn perfumes in their houses, and to make fires in the streets to prevent infection. This did not last above a day or two, the froth being dispersed by a strong gale of wind; but another evil quickly followed, for the wind drove the smoke upon most of the vineyards of Santerini, whereby the grapes in one night were utterly parched up and destroyed. It was also observed, that the smoke

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sullied plate and copper, and caused violent headachs, sickness, &c.

On the 31st of July the sea was perceived to smoke and bubble near the island in two different places, where the water formed a perfect circle, and looked like oil when set upon the fire. This lasted for above a month, during which time many fish were found dead on the shore. The following night a dull hollow noise was heard like the distant report of cannon; which was immediately followed by flames of fire shooting up from the furnace to a great height in the air, where they suddenly disappeared. The next day the same hollow sound was heard several times, and succeeded by a blackish smoke, which, notwithstanding a pretty fresh gale, rose up in the form of a column to a prodigious height; and this in the night would probably have appeared as if it were all on fire.

On the 7th of August the noise was different, resembling that of large stones thrown into a deep well; and the extremities of the island seemed to be in great commotion. This noise, after it had lasted some days, was succeeded by another much louder, which so nearly resembled thunder, as hardly to be distinguished from three or four real claps, that happened about the same time. On the 21st the fire and smoke were considerably diminished, but the next morning they broke out with greater fury than before. The smoke was red and very thick, and the heat so intense, that all round the island the sea smoked and bubbled up in a most surprising manner. At night Mr. Goree, viewing with a telescope the large furnace upon the highest part of the island, discovered sixty smaller openings or funnels, all of which emitted

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a very bright flame; and he imagined there might be as many more on the opposite side of the great volcano.

In the morning of the 23d, our author observed the island was much higher than the day before, and that its breadth was increased by a chain of rocks sprung up in the night, almost fifty feet above water. The sea was also covered again with the reddish froth above mentioned, which always appeared when the island received any considerable additions, and occasioned an intolerable stench, till it was dispersed by the wind and the motion of the waves.

The 5th of September the fire opened itself another vent at the extremity of the Black Island, from whence it issued for several days, during which time there came but little out of the large furnace: and from this new passage it was surprising to see the fire dart up three several times to a vast height, resembling so many sky-rockets of a glowing lively red. The following night the subterraneous thunder made a terrible noise, and immediately afterwards a thousand sheaves of fire, as it were, flew up into the air, where, breaking and dispersing, they fell like a shower of stars upon the island, which appeared all in a blaze, presenting to the astonished spectators a most dreadful and beautiful illumination. To these natural fireworks succeeded a kind of meteor, which hung for some time over the castle of Scaro like a fiery sword, and increased the consternation of the inhabitants.

On the 9th of September the White and Black islands united, after which the western end of the island daily increased. There were now only four openings that emitted flames, which came

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out with great impetuosity, sometimes attended with a noise like a large organ-pipe, and sometimes like the howling of wild beasts. On the 12th the subterraneous noise was considerably augmented, having never been so dreadful, nor so frequent as that day and the following. The bursts of it, like a general discharge of artillery, were repeated ten or twelve times in four and twenty hours, and immediately after each clap the large furnace threw up huge red-hot stones, which fell into the sea at a great distance. These claps were invariably followed by a thick smoke, which spread clouds of ashes over the sea and the neighbing islands.

On the 18th of September an earthquake was felt at Santerini, which did no great damage, but considerably enlarged the burning island, and gave vent to the fire and smoke in several new places. The claps were also more terrible than ever, and so violent, that it seemed as if every house in Scaro must have been shaken to the ground; and in the midst of a thick smoke, which appeared like a mountain, one might see and hear large pieces of rock thrown up with as much noise and force as bullets from the mouth of a cannon, and afterwards fall down upon the island, or into the sea. One of the neighbouring islands was several times covered with these fiery stones, which being thinly incrusted with sulphur, gave a very bright light, and continued burning till that was consumed.

On the 21st of the same month, after a dreadful clap of subterraneous thunder, very great lightnings ensued; and at the same instant the new island was so violently shaken, that part of the large furnace came tumbling down, and huge

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burning rocks were thrown to the distance of two miles. This seemed to be the last effort of the volcano, and to have exhausted the combustible matter, especially as all was quiet for several days after: but on the 25th the fire broke out again with still greater fury; and amongst the claps there was one so terrible, that the churches of Santerini were presently filled with crowds of people, expecting every moment would be their last, and the castle of Scaro suffered such a violent shock, that the doors and windows both of that and the houses flew open. Thus the volcano continued to rage during the remaining part of the year, and in the month of January 1708; the large furnace, without one day's intermission, throwing out stones and flames, at least once or twice, but oftener five or six times a day.

The 10th of February, in the morning, a pretty strong earthquake was felt at Santerini, which the inhabitants regarded as a prelude to greater commotions in the burning island. Nor were they deceived in their expectation; for soon after, the fire and smoke issued in prodigious quantities, the claps like thunder were redoubled, and nothing appeared but horror and confusion. Rocks of amazing bulk were raised up to a great height above the water, and the sea raged and boiled to such a degree, that it occasioned a general consternation. Subterraneous bellowings were also heard without intermission, and sometimes in less than a quarter of an hour there were six or seven eruptions from the large furnace. The noise of the repeated claps, the quantity of huge stones that flew about on every side, the houses tottering to their very foundations, and the fire, which now appeared in open day, surpassed all that had hi-

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therto happened, and formed a scene tremendous beyond description.

The 15th of April was remarkable for the number and violence of the bellowings and eruptions, by one of which near a hundred large stones were thrown up together in the air, and fell again into the sea at about two miles distance. From this time to the 23d of May (the anniversary of the birth of the new island) things continued much in the same state, but afterwards the fire and smoke subsided by degrees, and the subterraneous thunders grew less terrible.

On the 15th of July our author, accompanied by the Latin bishop of Santerini, and some other ecclesiastics, hired a boat to take a near view of the island, and to land upon it if they found it practicable. They made directly towards it on that side where the sea did not bubble, but where it smoked very much. Being got into this vapour, they perceived a close suffocating heat, and found the water extremely hot; whereupon they directed their course towards that part of the island which was farthest distant from the large furnace. The fires, which still continued to burn, and the boiling of the sea, obliged them to take a great compass, and yet they felt the air about them very hot and sultry.

Having coasted round the island, and surveyed it carefully from an adjacent one, they judged it to be two hundred feet above the sea, about a mile broad, and five miles in circumference: but not being thoroughly satisfied with this view of it, they resolved to attempt once more to land, and accordingly rowed towards that part of the island where no fire or smoke had been perceived: but when they had got within a hundred yards of the

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place, the great furnace discharged itself with its usual fury, and the wind blew upon them a thick smoke and a shower of ashes, which obliged them to quit their design. Having retired a little, they let down a plummet, and had ninety-five fathom water without finding the bottom, the line not being long enough. On their return to Santerini, they observed that the heat of the water had melted most of the pitch from their boat, which was therefore grown very leaky.

From this time till the 15th of August, when F. Goree left Santerini, the fire, smoke, and noise continued pretty moderate; and by the accounts he received for several years afterwards, it appears that the island still increased, but that the fire and subterraneous noise were very much abated: and our author supposes, as there is no likelihood that the fire will make itself a passage at the bottom of the sea, so as to let in the water to extinguish it, that the volcano will not have an end, till the mine of sulphur that feeds it be entirely consumed.

As strange as it may seem, that islands should be raised from the bottom of the sea, the instance we have here given is unquestionably true; and some persons are of opinion, that Santerini itself originally emerged above the waves in the same manner. Other islands have undoubtedly been rent and separated from the continent by violent storms, inundations, and earthquakes; to some of which causes perhaps our own island owes its formation; and it is observed, that the East-Indies, which abound in islands more than any other part of the world, are likewise most annoyed with tempests, lightning, volcanos, earthquakes, &c.—Varenius supposes, that St. Helena, Ascension, and other

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steep rocky islands, were formed by the sea's overflowing their neighbouring champaigns; and those of Zealand, Japan, &c. he thinks proceeded from the accumulation of vast quantities of sand and other terrestrial matters. Sumatra, Ceylon, and most of the East-Indian islands, he imagines were rent off from the main land, and concludes, that the islands of the Archipelago were formed in the same way; to which he imagines that the flood might possibly contribute.

But not to dwell upon conjectures, we shall add another yet more recent instance than that already given, of an island raised out of the sea by subterraneous fires, as we find it related in the Philosophical Transactions. On the 10th of December 1720, John Robinson, master of a small vessel from Piscataqua in New-England, arrived at Tercera, one of the Azores; and sailing from thence December the 18th, the next day about two o'clock, he arrived at an island which was literally covered with fire and smoke. The following night the ashes fell on his deck like hail or snow, upon which he bore from the island, the volcano roaring as loud as great guns or thunder. At break of day he stood towards it again, and sailed round it so near, that the fiery matter it ejected had like to have done him damage; and being also in danger of driving ashore, the consternation was such, that all on board betook themselves to prayers: but a small gale springing up, carried them clear, and they stood away for Tercera. The governor there informed them, that the fire broke out in the night of the 20th of November preceding, being accompanied with a prodigious noise and an earthquake, which shattered several houses in Angra, the chief town of Tercera, as well

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as in the neighbouring villages. Vast quantities of pumice-stones and half-broiled fish were found floating on the sea for many leagues round the island, and abundance of sea-fowl hovering about it.

To this surprising phenomenon, we must add a brief account of another in the Archipelago, which has been taken notice of in all ages, as one of the greatest wonders in nature, viz. the irregular flux and reflux of the Euripus, a famous strait dividing the island of Negropont from the continent of Greece. This channel is so narrow, that Egripos, the chief town of the island, has a communication with the main land by a stone bridge of four or five arches, and a draw-bridge just wide enough for a galley to pass through; in this part therefore the inconstancy of its tides is the most easily discerned.

The tides are sometimes regular and sometimes irregular, which F. Babin, who observed them very particularly, attributes partly to the situation of certain gulfs on each side of the strait, though he allows the moon to be the principal cause. From the three last days of the old moon to the eighth of the new, the tides are regular; the ninth they become irregular, and continue so till the thirteenth inclusively; the fourteenth they are regular again, and remain so till the twenty-first, from whence they are irregular to the twenty-seventh.

When the tides of the Euripus are regular, they flow twice in four and twenty hours, as in the ocean, and ebb as often, losing nearly an hour every day, and are about as long coming in as going out: but during the time of their irregularity they commonly flow and ebb nine or ten times in

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twenty-four hours, unless the wind blows hard; and our author himself, saw the water change its course three times in an hour and a half, though the wind was pretty strong against it. The tides of this channel usually rise to the height of twelve inches; and between the flux and reflux the water seems to stand still for a short time, insomuch that feathers or straws cannot be perceived to move on its surface.

From these observations it is easy to reconcile the authors who have written so differently on the Euripus; for those who mention no more than two fluxes and refluxes in twenty-four hours, as in the ocean, have only observed its motion during the days of its regularity: nor have the ancients delivered a falshood, in saying there are seven reciprocations in one day, for that happens even when the winds trouble and retard the flood; and Babin assures us, that in still weather the tides sometimes ebb and flow twelve or fourteen times in the space of four or five and twenty hours as he himself had observed, and was told by the millers who perceive their wheels change according to the course of the water.

The phenomena of the tides, which are really astonishing, and have perplexed the greatest philosophers, are well explained by Dr. Halley, from the Newtonian principle of gravitation and attraction, whereby all terrestrial bodies have a tendency towards the centre of the earth, and are also attracted towards the sun, moon, and other planets. If the earth were not affected by the action of the sun and moon, the ocean, being equally pressed by the force of gravity towards the centre, would continue in a perfect stagnation, always at the same height, without either ebbing or flowing;

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but as the sun and moon have a like principle of gravitation towards their centres, and the earth is within the activity of their attraction, it plainly follows, that the equality of the pressure of gravity on the earth must be disturbed, and the ocean, being fluid and yielding to the least force, shows where it is pressed according to its rising or sinking. Now the moon being very near the earth, in comparison of the sun and other heavenly bodies, our tides are chiefly regulated by its motions; and accordingly we observe, that the sea flows as often as the moon cuts the meridian, whether above or below the horizon; and ebbs when she passes the horizon, both in the eastern and western point: but as the moon is twelve hours and twenty-four minutes in passing from the superior to the inferior meridian, so every tide of flood is twenty-four minutes later than the preceding one; and thus we have two fluxes and two refluxes every five and twenty hours.

The high spring tides, upon the new and full moons, are occasioned by the attraction of the sun conspiring with that of the moon, whereas in the quarters the tides are weaker, because the sun raises the water where the moon depresses it. The reason why the sun's attraction has no greater influence on the tides, notwithstanding he is ten thousand times bigger than the earth and moon, is owing to the very small proportion the semidiameter of the earth bears to his immense distance. It is also observed, that the equinoctial spring-tides in March and September are the highest, and the nep-tides the lowest of all others; for the nearer the moon approaches the poles, the less is the agitation of the ocean, which is greatest of all when the moon is in the equinoctial, or farthest

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distant from the poles; whence the sun and moon being either conjoined or opposite in the equinoctial, produce the greatest spring-tides, and the subsequent nep-tides are always the least, being produced by the tropical moon in the quarters.

But besides these general tides, which would happen regularly every where, if the earth were all covered with deep sea, there are many others in which we find a vast diversity, and not to be accounted for, without an exact knowledge of local circumstances, as the position of the land, the shallowness of the water, the narrowness of the channels, &c. for the tide is always found to set strongest where the sea is narrowest, the same quantity of water being in that case to run through a smaller passage. This is evident between Portland and Cape la Hogue in Normandy, where the tide runs like a sluice, and would be yet stronger between Dover and Calais, if it were not checked by the tide coming round the island. In short, every thing relating to the tides is to be accounted for from the Newtonian doctrine; as why lakes, such as the Caspian sea, and midland seas, such as the Baltic, the Black Sea, and the Mediterranean, have scarcely any sensible tides; for lakes, having no communication with the ocean, can neither increase nor diminish their water, so as to rise or fall; and seas that communicate with it by such narrow inlets, and are of such a vast extent, cannot in a few hours receive or empty water enough to raise or sink their surface in a sensible manner. Sir Isaac Newton accounts for the strong tides in the port of Tonquin in China, (where there is but one flood and ebb in twenty-four hours, and none at all when the moon is near the equinoctial) from the concurrence of two tides, the one out of

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the great South Sea, the other out of the Indian Sea between the islands; and as the appearance of these tides is naturally deducible from his principles, it is a strong argument in favour of his whole theory.

We shall conclude this subject with observing, that though the Mediterranean has no sensible tides, except some small ones in the gulf of Venice, that of the Euripus abovementioned, &c. yet a strong current continually sets into it from the ocean through the straits of Gibraltar, and likewise through the Hellespont from the Euxine and the Propontis; whence one would imagine, that instead of not swelling like the ocean, it should rather overflow its bounds, and inundate the adjacent countries. What becomes of the vast quantity of water thus poured into the Mediterranean, is a speculation that has long employed the philosophers. Dr. Smith accounts for it, by supposing an under current to carry off as much water as the upper one brings in; and such currents it is probable there are in several parts of the sea: but Dr. Halley, without having recourse to this hypothesis, solves the phenomenon from the great evaporation. The result of an experiment, made by this excellent author, to find the quantity of vapour raised from the sea by the action of the sun, was, that the thickness of water evaporated from the surface of the sea in summer, is one fifty-third part of an inch in the space of two hours; which, for the ease of calculation, being supposed only a sixtieth part, the quantity exhaled in twelve hours will be one tenth of an inch. On this principle every square mile will be found to evaporate, in twelve hours, six thousand nine hundred and fourteen tuns of water;

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and every square degree, supposed of sixty-nine English miles, will evaporate thirty-three millions of tuns. Now the area of the Mediterranean being estimated at one hundred and sixty square degrees, it will lose in vapour, in a summer's day, five thousand two hundred and eighty millions of tuns; and yet this quantity of vapour, great as it is, is only the remains of what is raised by the winds, which sometimes sweep off the water faster than it is exhaled by the heat of the sun.

With respect to the quantity of water received by the Mediterranean, the Doctor supposes the Ebro, Rhone, Tyber, Po, Danube, Niester, Boristhenes, Tanais, and Nile, to furnish each of them ten times as much water as the Thames; not that any of them are in reality so great, but so to allow for the lesser rivers that fall into it; and as the Thames is computed to evacuate daily twenty million three hundred thousand tuns of water, the nine rivers abovementioned will only evacuate one thousand eight hundred and twenty-seven millions of tuns in a day, which is little more than a third of what is raised in that time in vapour. To this vast store of vapours raised by the sun, winds, or subterraneous fires, from the sea, lakes, rivers, &c. the Doctor refers the origin of springs.

This account may serve to explain why the Caspian sea, into which many vast rivers discharge themselves, and which has no visible outlet, does not overflow its banks; and it may also show why the Almighty has placed spacious lakes in many other countries, at a distance from the sea. Were it not for these bodies of water that supply the clouds with rain, such countries would have no refreshing showers; the reservoirs in the hills and

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mountains, which gush out in springs, and give rise to many rivers, would soon fail; water would be in a manner unknown; vegetation would gradually cease; and many regions of great extent, now remarkable for their fertility, would become barren and desolate.

MINERALS, FOSSILS, &c.

THE Turkish dominions in Europe being very extensive, and the soil various, afford a great quantity of useful fossils, and some mines of the richer metals. Near Siderocapsa, a town of Macedonia, lying north-east of Solonichi, mines of gold were discovered in the time of Philip, the father of Alexander the Great, from whence the town was anciently called Chrysitis.—Argentiera, a little island in the Archipelago, derives its modern name from its mines of silver, which were once wrought; and M. Tournefort informs us, that the workhouses and furnaces, where they used to prepare the metal, are still to be seen; but at present the inhabitants dare not meddle with that sort of work without asking permission of their despotic masters, who would make it a pretence for loading them with heavy taxes.—Siphanto, another island of the Archipelago, was anciently famous for its mines of gold and silver; but the places where they were, are now scarcely known to the inhabitants. The island, however, abounds with lead, according to M. Tournefort, who tells us, that about the middle of the last century, some Jews came thither, by order of the Porte, to exa-

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mine into the mines; but the natives, fearing they should be forced to work them, bribed the captain of the galliot, that brought over the Jews, to sink his vessel, which he accordingly did, by boring holes in it while the Jews were aboard, who all went to the bottom with a cargo of ore, whilst the captain saved himself in his long-boat. After this, some other Jews were sent on a similar errand, but met with no better success; for the Siphantines gave a sum of money to a French corsair to cannonade and sink the galliot when she had got her lading: so that both Jews and Turks were compelled to abandon their enterprize.

Various parts of Greece, and several islands in the Archipelago, abound with excellent marble, though many of the quarries so famous in antiquity are now lost or exhausted. Mr. Wheeler mentions a Greek monastery called Penteli, situated under a mountain of the same name, which, he says, is a perfect rock of white marble. Here he observed many curious grottos, lined with beautiful congelations, which are not uncommon in such places; and, at a little distance, he saw the quarries, from whence vast quantities of marble had been dug for the finest structures in Athens; which induced him to suppose that this was the mountain Pentelicus, so often mentioned by Pausanias on account of its marble.

Almost every one knows how famous the island of Paros has ever been for its beautiful marble, as it is more frequently noticed in the writings of the ancients than any other kind, and was chiefly used for statues by the most celebrated sculptors of antiquity. The Parian marble is of a firm,

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compact, and close texture, remarkably heavy, and of a very elegant white, but generally with some mixture of a faint bluish cast, and frequently veined with blue streaks of different breadth. It is extremely bright and glittering, and capable of the finest polish of all the marble class; which, together, with its not being very difficult to cut, has made it a favourite kind among our modern as well as among the ancient statuaries.

Being principally used by those artists, we now know it under the name of statuary marble; and yet M. Tournefort affirms, that the best judges prefer the Italian to the Grecian marble, because the latter gives false lights, and flies in little bits if not cautiously managed, whereas that of Italy obeys the chisel, and is of a much finer and closer grain. To the island of Paros we are indebted for one of the noblest monuments of antiquity in the world, viz. the Arundelian marbles, which are now preserved in the university of Oxford.

The sulphur of Milo was generally esteemed among the ancients, and particularly recommended by Pliny and Dioscorides. M. Tournefort says, it is very beautiful, having a greenish shining cast, and is found in lumps by digging up the ground, and in large veins in the quarries where they get their mill-stones.

There are in this island several mines of alum, the entrance into which is narrrow, and the vaults or chambers scarcely high enough for a man to stand upright. Here the alum grows in a sort of flakes about an inch thick, and as these are taken away, new ones in a short time supply their places. But the greatest curiosity which Milo affords, is the plumose, or feathered alum, so

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called from its form, being an efflorescence of alum, composed of straight parallel threads or fibres, resembling the veins of a feather *. The pieces of this alum, in the caverns where they have rest and room enough to shoot, are found an inch and a half or two inches in length, and as thick as one's finger; and are of the same kind, but larger, with the fibrous efflorescences found on the surface of Irish slate, and other alum-ores of our own country.

Besides the feathered alum, the caverns of Milo, whose roofs, sides, and floors are all of alum-ore, afford us a liquid alum, or a strong solution of alum in water; for the vapours sent up continually from the inner parts of the earth are condensed in these caverns into drops, which, as they fall from the roofs and trickle down the sides, wash off and dissolve the plumose efflorescences, and are collected in the cavities of the floor in little puddles, which are sometimes so

* This is the true Alumen plumosum of the ancients, and what the Greeks called Schiston or Trichitis, from its splitting into a number of whitish hairs or capillaments. It has been strangely confounded, even by some who have professedly written on drugs, with a species of the Lapis Amiantus; and this stone is at present known in the shops under the name of Alumen Plumosum, though it has neither the taste, nor any one of the qualities or properties of alum. It is therefore happy for us, as Dr. Hill observes, that our physicians have forgot to prescribe the alumen plumosum, since the apothecaries would certainly use the amiantus instead of it; and how improper the latter must be for internal use, may be judged from its effects when applied externally, its spiculæ making their way into and lodging themselves in the skin, and occasioning swellings, with the most violent and intolerable itching.

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highly saturated with this salt, as to be white and milky, and sometimes less sated, and clear as common water. In both cases, however, the water contains a great quantity of alum in a fluid state; and this is undoubtedly the origin of what some have supposed to be a native liquid alum.

M. Tournefort accounts for the formation of alum and sulphur in the island of Milo in the following manner. He observes, that the island is almost entirely a hollow rock, spungy and soaked, as it were, with the salt water of the sea, which enters into a multitude of openings on the coast, and is thence conveyed to the minutest cavities. Here he supposes, the sea-salt undergoes a sort of chymical process, the subterraneous fires, which are continually burning in this island, causing an acid spirit to separate from the salt, not unlike that we draw from sea-salt by common fire. This acid gradually penetrating the hardest rocks, dissolves them, incorporates with them, and is converted into alum; in like manner as we see spirit of salt, when poured upon common stones or chalk, produces aluminous concretions. The same acid spirit, mixed with the bituminous matter that pervades the veins of the earth, occasions the formation of sulphur; for it is well known that sulphur is a fat substance fixed by an acid spirit; and the sea-water contains oily as well as saline particles, both of which are strained from it by the singular structure of the interior parts of the island.

Emery is found in great plenty in the island of Naxia, where the inhabitants turn it up as they plough the ground, and sell a quintal of it for a crown, their quintal being a hundred and

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forty pounds. This mineral is extremely hard and heavy, and the consumption is considerable amongst armourers, cutlers, smiths, glass-grinders, lapidaries, masons, and other artificers, being used in polishing and burnishing iron and steel works, and in cutting glass, marble, and precious stones. Dr. Hill supposes that it is nothing but an iron ore, and has a near relation to the magnet; neither of them, though usually supposed distinct natural bodies, being properly so, any more than any other of the ores of metals. It is found in masses of no determinate shape or size, and is usually of a dusky brownish red on the surface, but when broken, it is of a bright iron-grey, though not without some tinge of redness, and is spangled all over with shining specks, which are small flakes of talc highly impregnated with iron. Sometimes it is very red, and contains veins of gold, but this is rarely to be met with. The sort that is commonly used is found in the island of Guernsey, Tuscany, and many parts of Germany.

The island of Argentiera (formerly Cimolus) abounds with a heavy, whitish kind of earth or marble, the Terra Cimolia of the ancients. It is also found in other islands of the Archipelago, and generally lies either on the surface or a little below it, being moderately moist, and not at all tough or viscid. It is easily cut through with a spade, which leaves it rough and uneven, and often breaks it into rude irregular pieces. When dried it becomes of a pure bright white, and of a closer texture. It is very soft to the touch, is easily broken between the fingers, adheres firmly to the tongue, and melts readily in the mouth, but leaves a considerable grittiness between the

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teeth. This marle, being fat and soapy, is used by the inhabitants of the island in washing of linen; and Pliny mentions its being used by the ancients in cleaning of cloths. They likewise used it in medicine, but it has little share in the modern practice. — What we call Cimolia alba, is the white tobacco-pipe clay, from which that of the ancients is easily distinguished, by its want of tenacity and its alkaline quality; and to our fullers'-earth we have given the name of Cimolia purpurascens, whereas the ancient purple Cimolia was in all probability the steatites or soap-rock, as we commonly call it, which is a hard white clay, with veins of purple, not only found in the islands of the Archipelago, but also in many parts of Cornwall and Devonshire.

The Lemnian earth, so called from its being dug in the island of Lemnos, deserves to be mentioned on account of the great reputation it has had in all ages for its medicinal virtues. There are three sorts of this earth, viz. white, yellow, and red, of which the last is most esteemed. It is a heavy, close, and compact earth, of a regular texture, and pale red colour; and of a smooth and even surface, but not glossy. It melts slowly in the mouth, and has an astringent taste, but leaves some grittiness between the teeth: it does not stain the hands, nor break readily between the fingers.

As this earth is found no where but in Lemnos, so the true medicinal red sort is only dug out of one pit, in which it constitutes the lower stratum, lying underneath the yellow. This pit is annually opened with great solemnity, the Greek priests rehearsing some forms of prayer, at which all the considerable inhabitants of the island, both Greeks

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and Turks, are present. At that time they take out as much as they think sufficient for the year's demand, the greatest part of which is sent to Constantinople to the Grand Signior, with whose seal it is marked; and the rest is sold to merchants upon the spot, partly sealed, and partly unsealed; but those who buy it rough generally get it sealed before they offer it to sale. That sealed in the island has usually some Arabic characters upon it, and on the other we often find a crescent and three stars, the inscription "Terra Lemnia," and under it two palm-branches: but notwithstanding this and other earths are generally imported to us sealed, they are liable to many adulterations, and none of them more so than the Lemnian, which is so often counterfeited and sophisticated, both here and by the Turks themselves, that few people, except those who have seen it dug out of the pit, are able to discover the imposture.—This earth yields a small quantity of volatile urinous salt, of another not much different from sea-salt, and of a bituminous oil; so that it is not a mere dead earth, endued with no other quality but that of an absorbent, as some of the moderns have imagined. It is useful in dysenteries, diarrhœas, and hæmorrhages; is an admirable diaphoretic, and may prove salutary in malignant fevers.

There is another kind of earth called Turkey Earth, which is sometimes sold instead of the Lemnian, but is not of so compact a texture, though it is remarkably heavy. It breaks easily between the fingers, and is reddish on the surface, but more of an ash-colour within. Great plenty of it is dug in the neighbourhood of Adrianople, and it is used by the Turks as a

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sudorific and astringent, and is famous among them in pestilential diseases.

We might here enumerate several other fossils of a similar nature; but as the subject affords very little entertainment, we shall only add another, which is dug out of a hill near Thebes, in the road leading to Negropont. This is a stone, or kind of clay, which, when first taken out of the pit, is of the colour of new cheese, and almost as soft; but when it is dry, it becomes very hard, glossy, and as white as snow. The people of Thebes carve this stone very curiously into bowls for tobacco pipes, the best of which are sold for five-pence or six-pence a-piece, and an inferior sort at about half that price.

VEGETABLES.

AMONGST the many curious plants to be found in the Turkish dominions, none seems more deserving of attention than the Tragacantha, or goat's-thorn, which grows plentifully in several parts of the Levant, and particularly on mount Ida in Candia. The gum we corruptly call gum dragon, issues spontaneously from this plant towards the end of June and the two following months, at which time the nutritious juice, thickened by the heat, bursts the vessels that contain it; and being coagulated into small threads, these make their way by little and little through the bark, are hardened in the air, and formed either into lumps or slender pieces twisted like worms, of different lengths, according to the quantity of

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extravasated matter. The contraction of the fibres of the plant, probably may contribute to the expression of the gum; for these delicate fibres, like those of flax, being laid bare and trampled under foot by men and beasts, are shrivelled by the heat, and facilitate the emanation of the extravasated juice.—This gum is of different colours, white, greyish, red, and sometimes almost black; but that which is white, smooth, and twisted, is reckoned the best. Externally used it is efficacious in a dysentery, and dissolved in milk or rose-water is good for the redness and acrimonious humours, affecting the eyes, and for asperities of the eyelids. It is also of service in a hoarseness, spitting of blood, and some other complaints.

The island of Candia likewise affords plenty of the Cistus ladanifera, a shrub yielding an odoriferous sort of gum called ladanum, which oozes out of the leaves like a fatty dew, in shining drops, as clear as turpentine. This shrub is full of branches, and rises to the height of two or three feet, bearing a flower an inch and a half in diameter, consisting of five rose-coloured leaves, marked with a yellow speck in the middle. From the centre of these leaves arise several yellow threads or chives, which surround the pistil; and when the flower falls off the pistil is changed into a fruit, containing abundance of small angular seeds, of a red colour, and disposed in five different vessels or apartments.

The chief branches of this shrub are about the thickness of one's little finger, and are divided into sprigs, bearing leaves that grow by couples, of a dark green, and waved at the edges.—The gum issuing from the cistus is gathered in hot, calm weather, by brushing it off the leaves with a sort

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of whip, composed of a great number of lashes, to which the ladanum adheres when they are dragged over the shrub, and from whence it is afterwards scraped and made up into a mass or cakes of different sizes.

Dioscorides says, that in his time it was customary to comb off the ladanum from the beards and thighs of the goats which fed upon the leaves of the cistus; but it is now gathered in the manner above-mentioned, as M. Tournefort relates, who saw the country people employed about it, and says, the work is rather unpleasant than laborious, as it must be done in the heat of the day, and when there is no wind stirring, and yet the purest ladanum is not free from filth, because of the dust blown upon it in windy weather. Sometimes it is mixed with a fine blackish sand, in order to increase its weight; but this imposition may be detected by chewing it, or straining it after it is dissolved.—This gum mollifies, digests, maturates, and attenuates; and, externally applied, is good against the tooth-ach, heartburn, and pains of the stomach. In dysenteries and hoarseness it is also an excellent balsamic.

The plant called Panax Herculea, grows plentifully in Achaia, Bœotia, and other parts of Greece, and may be seen in the gardens of the curious. From incisions made in the stem of this plant, especially near the root, during the summer-months, a juice flows which concretes spontaneously, and is called opopanax. If good, it is externally of a yellow colour, but internally white, or inclining to yellow, of a bitter taste, a strong smell, and pinguious consistence.—As to its virtues, it mollifies, digests, discusses flatulencies, and removes thick and viscid phlegm from the

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brain, nerves, joints, and thorax. The roots are also said to be effectual in all cold affections of the brain and nerves, disorders of the breast, and violent pains of the stomach. In short, this is one of the celebrated panaceas of the ancients, to which they attributed such wonderful virtues.

We must not here omit taking notice of that useful vegetable production called the cotton-bush, which is cultivated in Greece, and in several of the islands of the Archipelago, as well as in many parts of Asiatic Turkey, the East-Indies, and other countries. This plant grows as high as a rose-bush, has leaves like maple, and puts out yellow flowers, which leave behind them little cods, that increase as they ripen to the size of a walnut, and being opened by the heat of the sun, discover a down of remarkable whiteness, which is the cotton. The down encompasses several little beans, which are the seeds of the plant, and are separated by a sort of mill, which being worked by the motion of a wheel, the cotton falls on one side, and the seed on the other.

There is also another kind of cotton-plant, called gossipium-herbaceum, which creeps along the ground as the vine would do if unsupported; and the cotton of this is the most esteemed.—Cotton makes a considerable article in commerce, being spun and manufactured into stockings, waistcoats, quilts, tapestry, curtains, and various other conveniences. Muslins are made entirely of cotton, and it is frequently mixed with wool, silk, and flax, in the composition of other stuffs. Abundance of cotton grows about Smyrna, from whence ten thousand bales are annually exported, and as much at least is used in the manufactures of the country.

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The carob, or St. John's bread tree, is found in great abundance on the island of Cyprus. It is an evergreen, and produces a quantity of long, flat pods, the succulent pulp of which has the honied flavour of manna; and is purchased by the poorer class of Egyptians, Arabs, &c. as an article of food. In Europe it is given to mules, oxen, &c. and is sometimes eaten by the inhabitants, when there is a scarcity of other provisions.

In the time of the ancient Romans, the carob tree was very plentiful in Italy; and its fruit, which was called *siliqua*, served as a weight: nine pods were required to make a scruple, and as the pound consisted of two hundred and eighty-eight scruples, it also required seven hundred and eighty-eight pods to make its weight. It may easily be supposed, however, that this mode of weighing could not be very exact.—The pods of this tree are called St. John's bread, from a vulgar notion that these were the locusts which St. John ate with his honey in the wilderness.—Carob trees may be propagated in England from seeds; but these must be sown in a moderate hot-bed, and the plants inured to the open air by degrees.

The island of Cyprus also produces great quantities of madder, called *ali-zary*, which is more esteemed than the best Zealand madder imported by the Dutch; and experiments have shown that it is superior to any other kind as a dyeing ingredient.—The flower of the madder consists of one single leaf, which is divided into four or five segments, and expanded at the top; the flower-cup afterwards becomes a fruit, composed of two juicy berries, closely joined together, and containing seed; the leaves are rough, and surround the stalks. The root of this plant, when eaten by

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animals, tinges their bones of a deep red: it also impregnates water with a dull red colour, and spirit of wine with a deep bright red. When manufactured, this commodity is distinguished into different kinds, as grape madder, bunch-madder, &c. The grape madder is the heart of the root; the other, besides the heart, consists also of the bark and small fibres proceeding from the principal root. For the grape madder, the finest roots are picked out, the bark separated at the mill, and the inside root kept moist in casks for three or four years, in order to render it more proper for dyeing. It should be chosen of a fine saffron colour, in very hard lumps, and of a strong though not disagreeable smell.

Mr. Margraaf has shown how a very durable lake of a fine colour, fit for painting, may be obtained from madder.—The process is as follows: "Take two ounces of the purest Roman alum, and dissolve it in three quarts of distilled water that has boiled in a clean glazed pot. Set the pot on a fire; and when the water begins to boil withdraw it, and add two ounces of the best madder. Boil the mixture once or twice; then remove it from the fire, and filter it through a double filter of white paper. Let the liquor thus filtrated stand a night to settle, and pour it off into the glazed pot, previously well cleaned. Make the liquor hot, and add to it gradually a clear solution of salt of tartar in water, till all the madder is precipitated. Filtrate the mixture again; and upon the red precipitate which remains upon the filter, pour boiling distilled water, till the water no longer acquires a saline taste. The red lake is then to be gently dried.—The colour of the above precipitate is deep; but if two parts of madder be

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used to one part of alum, the colour will be still deeper: one part of madder and four of alum will produce a beautiful rose colour."

The famous fraxinella, or dittany, which has been renowned for many ages on account of its medicinal virtues, is found in great profusion on the rocks of Candia. The peasants collect it carefully, and tie it up in small bundles, which they take to the market of Canea, and some other towns, where it is universally esteemed. M. Sonnini observes, that he has used this plant with great success on several occasions; that it is a good vulnerary and stomachic; and that it will retain a considerable share of its fragrance for twenty years.—Virgil and some other authors have asserted that the wild goats invariably eat dittany when they are wounded with darts or arrows.

ANIMALS.

THERE is a great variety of the feathered species which frequent the islands of the Archipelago and the coasts of Greece, but none of them more remarkable than a sort of sea fowl called Toubana by the modern Greeks, and thought by M. Spon to be the Onocrotalis of Pliny. This bird is what we call a Pelican, and is described by Sir George Wheeler, who took one of them near Lepanto, to be as big as a swan, (but its neck not so long) web-footed, and of a greyish colour, like a common goose. It has a beak seventeen or eighteen inches long, and about two inches broad where widest; but when it opens, the under part of the beak, being of a flexible

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nature, expands itself to the breadth of five or six inches. To this beak, near the entrance of the throat, is joined a bag of a skinny substance, which, when it is empty, and the bird's mouth shut, shrinks together like a bladder before it is blown, and is scarcely visible; but when filled it stretches to an incredible size, so as to contain eight or ten quarts of water.

In these bags the pelicans are said to carry fish and water to their young ones in the mountains where they breed, for which purpose they chuse the most unfrequented places. The throat of this fowl is large enough to swallow a carp twelve inches long; and the upper part of its beak terminates in a sharp hook, well adapted for catching fish, on which it chiefly subsists. Its gizzard is not a round fleshy substance, like that of other fowls, but somewhat harder than the entrails, about six inches long, and above an inch in diameter. Its lungs are of a membranous texture, adhering closely to the ribs on each side, and of a reddish colour.—The pelican is said to live to a great age, and has sometimes been completely domesticated.

Sir George Wheeler has likewise given us a description of a tree-frog, or spordaca, which he says is shaped like other frogs, but something smaller. Its upper parts are green, and the abdomen is whitish, marked by numerous granules: the under surfaces of the limbs are reddish; and on each side of the body is a longitudinal, blackish or violet-coloured streak. When it lies close to the ground, it resembles one half of a large walnut with the convex part uppermost; for then its feet are so doubled underneath it, as not to be discerned. In disposition, however, it is very different from

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the common frogs; for whereas those love to be always amongst the grass or in the water, this kind delights to climb shrubs, bushes, and trees, and to sit chirping on the twigs and branches. For this purpose nature has made a peculiar provision, its toes ending in little round knobs, about the bigness of a pin's head, out of which issues a clammy substance, that preserves it from falling when it leaps from one bough to another; for if it can but touch the smallest twig, or the smoothest leaf, with any of its feet, it adheres fast to it by that viscous matter, and easily recovers its whole body. This may seem incredible, but our author observed it very often, and could not perceive that the frog held by grasping with its feet, as birds and squirrels do, but merely by the strengh of the glutinous substance discharged from its toes; which, however, we must suppose it can emit or retain at pleasure, or else it would prevent its leaping as well as falling.

Although this animal constantly remains in the woods during summer, yet about the end of autumn it retires to the waters, and lies under the banks, in a state of torpidity, till the ensuing spring; when it emerges to deposit its spawn in the water. At this period the male inflates its throat in a surprising manner, and utters a sharp croaking note, that may be heard to a very considerable distance.

Dr. Townson had, at one time, some tree-frogs, which he kept in a bowl of water in his window. They soon grew perfectly tame, and to two of them, which were particular favorites, the doctor gave the names of Damon and Musidora. In the hot weather they frequently left the bowl, and sometimes descended to the floor, but soon

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became lank and emaciated. At the approach of evening they always retired into the water, unless the weather was cold and damp; in which case they would sometimes remain out a couple of days. If a few drops of water were thrown upon the floor, they always applied their bodies to it as close as possible; and from this absorption through the skin, though they were flaccid before, they soon regained their plumpness.

One of these animals which had not been in water during the night was weighed, and then immersed: after remaining about half an hour in the bowl, it was found to have absorbed nearly half its own weight of water. From other experiments it was discovered that the tree-frogs frequently absorbed nearly their whole weight of water, and that merely by the under surface of the body. Sometimes they eject water with a considerable force from their bodies, to the quantity of a fourth part of their own weight.

An animal of this description was kept by a surgeon in Germany for near eight years. He had it in a glass vessel covered with a net, and during the summer he fed it with flies; but in winter it probably did not eat at all, as only a few insects, with grass and moistened hay, were put to it. At this time it was lean and emaciated; but at the return of summer it soon became fat.

As mount Hymettus in Greece was always famous for its excellent honey, the ancients imagining that bees were first bred there, and that the swarms dispersed over the world were only colonies from that mountain, this will be no improper place to give some account of those curious insects, so remarkable for their sagacity and economy, and whose labours are so advantageous

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to mankind.—With respect to their form, the bee is divided by two ligaments into three parts, the head, the breast, and the belly. The head is armed with two jaws and a trunk, the former of which play like two saws, opening and shutting to the right and left. The trunk is long and taper, and extremely pliant and flexible, being destined by nature for the insect to probe to the bottom of flowers through all the impediments of their chives and foliage, and drain them of their treasured sweets. But were this trunk to be always extended, it would prove incommodious, and be liable to be injured by a thousand accidents; it is therefore of such a structure, that, after the performance of its necessary functions, it may be contracted, or folded up; and besides this, it is fortified against all injuries by four strong scales, two of which closely sheath it, and the two others, whose cavities and dimensions are larger, encompass the whole.

From the middle part or breast of the bee grow the legs, which are six in number; and at the extremity of the paws are two little hooks, discernible by the microscope, which appear like sickles with their points opposite to each other. The wings are four, two greater and two smaller, which not only serve to transport them through the air, but by the noise they make, to give notice of their departure and arrival, and to animate them mutually to their several labours. The hairs, with which the whole body is covered, are of singular use in retaining the small dust that falls from the chives of the flowers.—The belly of the bee consists of six rings, which slide over one another, and may therefore be lengthened or contracted at pleasure; and the inside

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of this part of the body contains the intestines, the bag of honey, the bag of poison, and the sting. The office of the intestines is the same as in other animals. The bag of honey is transparent as crystal; containing the sweet juices extracted from flowers, which the bee discharges into the cells of the magazine for the support of the community in winter. The bag of poison hangs at the root of the sting; through the cavity of which, as through a pipe, the bee ejects some drops of this venomous liquor into the wound, and so renders the pain more excessive.

The mechanism of the sting is admirable, being composed of two darts, inclosed within a sheath that tapers into a fine point, near which is an opening to let out the poison. The two darts are ejected through another aperture, which, being armed with several sharp beards like those of fish-hooks, are not easily drawn back again by the bee; and indeed she never disengages them, if the wounded party happens to start and put her into confusion; but if one can have patience to continue calm and unmoved, she clinches those lateral points round the shaft of the dart, by which means she recovers her weapon, and gives less pain to the person stung. The liquor, which at the same time she infuses into the wound, causes a fermentation, attended with a swelling, which continues several days; but that may be prevented by immediately pulling out the sting, and enlarging the puncture, to let the venomous matter have room to escape.

We must now consider the generation, polity, and labours of these insects, the true knowledge of which has resulted in a great measure from the modern invention of glass hives, through which all

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the secrets of the community are laid open to a curious observer. Any person who carefully examines a hive, at different seasons of the year, will distinguish three sorts of bees; of which the greater number are the common working bees, who do all the business of the hive, and seem to be neither male nor female. The second sort, called drones, are the males, which are somewhat larger, have no sting, nor ever stir from the hive, but live upon the honey prepared by the others. The third sort is a much larger and longer-bodied bee, of which there is often but one in a hive, at least but one in every swarm or colony of young bees, who are from time to time detached from the hive in search of another habitation. This large bee is what the ancients called the king, from the respect they always saw paid to it by the other bees; but being a female, the moderns more properly give it the title of queen, or mother of the swarm.

Mr. Reaumur, desiring to try how far the accounts given of the homage paid by the others to the queen-bee was true, caused a swarm of bees to be swept down into a glass-hive. Among these there was one female, which was soon distinguished by her shape, and the shortness of her wings. For some time she walked alone at the bottom of the hive; the rest seeming to regard nothing but their own safety. The female, after going twice or thrice up the sides of the hive, to the top of it, where they were hung, at last went in among the cluster, and brought down about a dozen with her. Attended with these, she walked along slowly at the bottom of the hive. But the rest continuing at the top, she went again and again, till they all came down and formed a cir-

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cle about her, leaving her a free passage wherever she turned to walk, and feeding her with the honey they had gathered for themselves.

While the hive is sufficient to contain the bees without inconvenience, the society live peaceably together; but when their numbers are multiplied so that their habitation is too small, the young brood quit the place of their nativity, and fly in quest of a new settlement. The swarm that goes out consists of the common bees, under the conduct of one female or queen; or if two queens come out of the same hive, then the body of common bees divides into two parts, each following one female: both parties, however, when they alight out of the air, usually settle near each other on a branch of a tree; and then those bees which form the smallest swarm go off, one by one, to the other claster, deserting the queen they followed, who is at length murdered by her subjects. The swarm being thus united and hanging down from the tree, the countrymen, who are always vigilant on these occasions, provide for their accommodation a hive rubbed with balm, thyme, and other odoriferous herbs, into which they gently brush them from the branch, and carry them to a stand prepared for that purpose. All this the bees bear very patiently, and after they are a little composed, they begin to think of forming themselves convenient apartments in their new habitation.

When they set about this work, it is observed that they divide themselves into four bands, one of which flies into the fields to provide materials for the structure; the second works upon these materials, and forms them into a rough sketch of the dimensions and partitions of the cells; the

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third band examines and adjusts the angles, removes the superfluous wax, polishes the work, and gives it its necessary perfection; and the fourth is employed in bringing provisions to the labourers. M. Maraldi takes notice, that the bees employed in polishing the combs, work longer than those that build them, because polishing is not so laborious. They begin their work at the top of the hive, continuing it downwards to the bottom, and from one side to another; and to make it the more solid, they use a sort of tempered wax, which is pretty much like glue. The form of the cells of the honey-comb is hexagonal, which figure, besides what is common with a square and equilateral triangle, has the advantage of including a greater space within the same surface. The best mathematician, indeed, could not have chosen a more proper figure than the bees do for such a combination of apartments; for although circular cells would have been the most capacious, this would by no means have been a convenient figure, because much of the room would have been taken up by vacancies between the circles. It was therefore necessary to make use of some of the rectilinear figures, amongst which the only proper ones were the triangle, the square, and the hexagon; and the bees wisely chose that figure which consisted of most angles, as supposing it the most capacious.

The expedition of the bees in their labour is almost incredible; for, notwithstanding the elegance and just proportions of their work, they are so indefatigable, that in one day's time they will finish a honey-comb a foot long and six inches broad, capable of receiving three thousand bees. When the cells are completed, the queen takes

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possession of those she likes best, to deposit her eggs in, and the rest are left to be filled with honey. She lays one egg in each cell, and sometimes more than a hundred in a day; but what is most remarkable, as some affirm, she lays those eggs which are to produce common bees in cells of the common shape and size, those that are to become drones or males in larger cells, and in two or three great cells of a circular form, she deposits those which are to be females like herself. These eggs, having lain a short time in the cells, are hatched into white maggots, and are fed with honey for ten or twelve days, after which the other bees close up the cells with a thin piece of wax; and under this covering they become gradually transformed into bees, in the same manner as silk-worms are changed into butterflies. Having undergone this metamorphosis, the young bees pierce through their waxen doors, wipe off the humidity from their little wings, take their flight into the fields, rob the flowers of their sweets, and are perfectly acquainted with every necessary circumstance of their future conduct.—As to the males or drones, which are destined only to propagate their species, they live very comfortably for about three months after they are hatched; but when that time is over, and the females are impregnated, the common bees either kill them or drive them from the hive as burdensome to the community, and not a drone is to be found till the next season.

Of the reciprocal affection subsisting between the queen and the working bees, we find a most interesting account in Mr. Warder's Monarchy of Bees, the substance of which we shall lay before our readers.

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"Many years ago," says our author, "I wished to satisfy my curiosity respecting the queen bee, and was resolved to hazard the destroying of a single swarm for that purpose. One morning, about half an hour before sun-rise, I took a swarm of bees that had been hived the day before, and carried it into a meadow near my garden; and there, with a smart stroke, shook out all the bees in a lump upon the grass. After they had recovered from the confusion which so violent a motion produced among them, I laid down on the ground, and, with a little stick, gently stirred among them in order to find the queen. I at length discovered her, and, shutting her in a box, carried her into my apartment; where I let her fly, and a few of the other bees which I had taken along with her. They, as was natural, flew against the window. I therefore cut off one of her wings, and again shut her up in the box.

"I was now desirous to know how the other bees would act in the absence of their queen; and this I soon observed.—As soon as they discovered that she was not among them, they scattered themselves about in all directions, running up and down, with a most piteous and discontented note, in search of her. They spent about an hour in this fruitless search; after which they took wing, and alighted on a hedge at a little distance. This was the hedge where the same swarm had pitched the morning before; and it almost appeared as though they had gone to search for her in a place where they recollected having been, but a little time ago, in company with her. And now, instead of collecting themselves into a bunch, as is their custom when the queen is present, they scattered themselves along the hedge for many yards, in little parties of forty or fifty together.

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"Being desirous of knowing whether they would again acknowledge their crippled sovereign, I took the box from my pocket, and, having opened it, laid it on the bank, when the little wanderers immediately collected round it. Having thus found their queen again, they now continued in a cluster about her, and seemed perfectly happy and contented.

"Night coming on, I again hived them, and next morning knocked them out in the meadow as before; when they soon united themselves together about their sovereign. In this state I permitted them to continue for some hours, to observe whether they would rise; but in this the strength of their loyalty was fully evinced; for as the poor queen was unable to lead them to any place for their common preservation, her subjects chose rather to perish with her than to forsake her in distress.

"I again shut up the queen in my box; when the other bees, as before, spread themselves in every direction in search of her. Whilst they were in this situation, I put her down on one side of them: they all, in a moment, ceased their search, and advanced immediately towards her. Before she was quite concealed, I took her up, and put her in another place; when the bees all turned directly toward her again. After repeating this experiment a few times more, I suffered them to close round her. In this affecting situation they continued for the remainder of the day, not one of them offering to desert her, though by this time they must certainly have been very much in want of food. In the evening I hived them as before.

"On knocking them out the next morning, I

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formed a resolution of trying to what length these loyal creatures would carry their affection. They had now tasted no food for two days; and their queen had at least equalled them in this; for though I had repeatedly offered her some honey, she would not even taste it without her beloved subjects. But to draw this curious, though melancholy narrative to a conclusion, I must observe that they still retained their integrity, and even famine itself could not diminish their affection; for, after living five days and nights without the least sustenance, they all died of hunger. The queen bee existed a few hours longer than the rest, but at length surrendered a life which the destruction of her friends had rendered comfortless and insupportable."

The method in which the bees collect their wax and honey deserves to be explained, and is particularly worthy of attention.—At the bottom of all flowers there are certain glands which contain more or less honey, that is, the most exalted particles of the sugary juices of the plant. These juices the bee sucks up with its proboscis or trunk, and draws it into its mouth; and when it has thus taken a sufficient quantity into its stomach, it returns to the hive, and discharges the honey into the common magazine. When the cells prepared to receive it are full, the bees close up some with wax till they have occasion for the honey; the rest they leave open, to which all the members of the society resort, and take their repast with great moderation.

It is an excellent observation of a modern author, that the hive is a school to which numbers of people ought to be sent: for prudence, industry, benevolence, patriotism, economy, neat-

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ness, and temperance, are all visible among the bees. These little animals are actuated by a social spirit, which forms them into a body politic, immediately united, and perfectly happy. They all labour for the general advantage; they are all submissive to the laws and regulations of the community; having no particular interest, nor distinction, but those which nature or the necessities of their young have introduced amongst them. We never see them dissatisfied with their condition, or inclinable to abandon the hive in disgust, at finding themselves slaves or necessitous. On the contrary, they think themselves in perfect freedom, and perfect affluence; and such indeed is their real condition. They are free, because they only depend on the laws; and they are happy, because the concurrence of their several labours inevitably produces an abundance, which contributes to the riches of each individual. Human societies, compared with this, will appear altogether monstrous; for although necessity, reason and philosophy have established them for the commendable purposes of mutual aid and benefit, a spirit of selfishness too often destroys all; and one half of mankind, to load themselves with superfluities, leave the other destitute of common necessaries.

Naturalists have generally asserted, that the fine dust of the apices of flowers, collected amongst the hairs of the bee, which nature seems to have clothed it with for that purpose, was afterwards converted into wax; and some of the moderns, as well as the ancients, have imagined wax to be the excrement of this laborious insect: but the judicious Boerhaave supposes it to be a juice issuing from the leaves of plants, and adhering to

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their surface, where it is inspissated by the heat of the sun, as may be seen in rosemary by the help of a microscope. This the bees collect with their fore feet and jaws, and roll up into little balls, which they convey, one at a time, to the feet of their middle legs, and from thence to the middle joint of their hind legs, where there is a small cavity, like a spoon, to receive the burden.—When those bees who are employed in collecting the wax return to the hive, they are assisted by their companions in discharging their load, who by little and little pick off the wax from their legs, and carry it to the common treasure. With this they build their combs, observing a wonderful frugality, not the least grain of it being wasted or neglected.

Thus, as an ingenious author observes, their indulgent Creator has given them all implements necessary, either for building their combs, or composing their honey. They have each a portable vessel, in which they bring home their collected sweets; and they have the most commodious store-houses, wherein they deposit them. They readily distinguish every plant, which affords materials for their business: and are complete practitioners in the arts of separation and refinement. They are aware, that the vernal bloom and summer sun continue but for a season; and are therefore eager to improve every shining hour, and lay up a stock sufficient to supply the whole state, till the return of their flowery harvest.

Bees are extremely solicitous to remove such insects or other foreign bodies as happen to get admission into the hive. When so light as not to exceed their powers, they first kill the insect with their stings, and then drag it out with their teeth,

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But it sometimes happens, that a snail intrudes upon their retirement, and, although it is soon stung to death, the bees are incapable of removing so heavy a burden. To prevent the noxious odours, therefore, which might result from the animal's putrefaction, they immediately cover every part of its body with propolis, through which no effluvia can escape. When a snail with a shell gets entrance, it is disposed of with much less trouble; for as soon as it receives the first wound from a sting, it naturally retires within its shell; and the bees, by glueing all round the margin of the shell, render it for ever immoveable.

Almost every one knows the great and various uses of wax and honey, the consumption whereof, throughout the several parts of Europe, is incredible; and if honey were more used than it is, instead of sugar, it would be found of excellent service. Being very penetrating and deterging, it is good in all obstructions, especially from viscid and tough humours. It wonderfully promotes expectoration; nor is there any disorder arising from phlegm, or the produce of a cold constitution, in which it is not serviceable. But it is to be observed, that there is a peculiarity in some constitutions, which renders them incapable of bearing the least quantity of honey, without sickness and great uneasiness. In surgery, it is used to cleanse foul ulcers, either by immediate application, or washing them with liquors in which it has been dissolved.

Considering therefore the advantages arising from the labours of bees, is it not strange that our country-people are not more solicitous about the preservation and increase of these animals? It is

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certain they would multiply prodigiously with proper management; and we might, upon a moderate computation, have five thousand times as much wax and honey produced in this kingdom as we have at present. But instead of taking due care to keep them warm in winter, and to supply them with a sufficient quantity of food, vast numbers are suffered to perish annually; and still greater numbers are destroyed with the loss of an immense future progeny, by smothering whole swarms in the hive, in order to obtain the honey.

The Greek bee hives (according to Sir George Wheeler) are made of willows or osiers, and shaped like our common dust-baskets, being wider at the top than at bottom, and plastered with clay both within and without. Across the top of the hive they lay broad flat sticks, covering them with clay and straw to secure them from the weather. To these sticks the bees fasten their combs, so that they may be taken out whole, one by one, with the greatest ease imaginable. In March or April, to prevent the bees from swarming and flying away, they separate with a knife the sticks to which the combs are fastened, taking out those on each side, and placing them in the same order in another hive, till they are equally divided. Then having furnished each hive with more sticks, and covered them over as before, they set the new hive in the place of the old one, removing that to a neighbouring stand. This is done in the middle of the day, when the greatest part of the bees are abroad; who, at their return home, divide themselves without much difficulty, some taking to the new, and others to the old habitation. In August they take out the honey after the same manner, that is, separating the sticks

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on each side, and taking away the combs, till they have left only such a quantity in the middle, as they judge sufficient for the support of the bees in winter; brushing those on the combs into the hive again, and covering it afresh with sticks and plaster. This is also done in the day-time, when most of the bees are absent from the hive, and are therefore least disturbed themselves, and give their plunderers the least disturbance.

By this means the bees, instead of being destroyed, increase and multiply prodigiously, and make their masters ample amends for the little honey they leave them to feed upon in the winter. Besides, our author is of opinion, that the smoke of the sulphur used to destroy the bees, diminishes the fragrancy of the wax, and cannot communicate any good flavour to the honey.

This is the account Sir George Wheeler gives of the management of bees at a Greek monastery; on mount Hymettus, which is celebrated for the best honey in all Greece, and from whence a great quantity is sent to Constantinople. The same author mentions another monastery called Pendeli, not far from Hymettus, which, in his time, was under the protection of the sultaness mother, and the monks were obliged to pay, upon that account, six thousand weight of honey every year to a new mosque which she built at Constantinople, and to furnish it with as much more at the price of five dollars the quintal. He adds, that the fathers have seldom less than five thousand stocks of bees, with a great deal of arable land, vineyards, plantations of olive-trees, herds of cattle, flocks of sheep, and all other conveniencies their manner of life requires.

The Greek method above related was intro-

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duced into France, in 1754, as we are informed by M. de Reaumur and Du Hamel, in the "*Memoirs of the Royal Academy* for that year. In Scotland, Mr. Bonner has long saved the lives of his bees, and, throughout his *New Plan*, reprobates the barbarous practice of murdering them; and various methods have also been adopted in England, to attain the desirable end of getting the honey and wax without destroying the bees.

The Rev. Mr. White informs us, that his fondness for these little animals soon put him upon endeavouring to save them from fire and brimstone; that he thought he had reason to be content to share their labours for the present, and great reason to rejoice if he could at any time preserve their lives, to work for him another year; and that the chief design of his experiments and observations has been, to discover a cheap and easy method, by which even the poorest class of people may be enabled to take away a considerable quantity of honey without destroying the bees; and that they may, by the same means, encourage seasonable swarms.

In this gentleman's directions to make the bee-boxes of his inventing, he tells us, speaking of the construction of a single one, that it may be made of deal, or any other well-seasoned boards about an inch thick, which are not apt to warp or split. The figure of the box should be square, and its height and breadth nine inches every way measuring within. The front part must have a door cut in the middle of the bottom edge, three inches wide, and about half an inch in height, which will give full liberty to the bees to pass through, yet not be large enough for their enemy the mouse to enter. In the back part a hole should be cut, and glazed

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with a pane of fine crown glass, about five inches long and three broad; and the top of this glass should be placed as high as the roof within, that the upper part of the combs may be distinctly seen. The glass must also be covered with a thin piece of wood, by way of a shutter, which may be made to turn upon a nail, or to slide sideways between two mouldings. The side of the box which is to be joined to another box of the same form and dimensions, as it will not be exposed to the internal air, may be made of a piece of slit deal not half an inch thick. This the amiable projector calls the *side of communication*, because it is not to be wholly enclosed: a space is to be left at the bottom, the whole breadth of the box, and a little more than an inch in height; and a passage is to be made at the top three inches long, and rather more than half an inch wide. Through these the bees are to have a communication from one box to the other. "Next," says our author, "provide a loose board, half an inch thick, and large enough to cover the side where the communications are made; and have in readiness several iron staples, about an inch and a half long, with their points bent down rather more than half an inch. Then fix two sticks across the box from side to side, in order to be a stay to the combs; one about three inches from the bottom, and the other at the same distance from the top: and when the whole is painted to make it more durable, the box is completed.

"The judicious bee-master," continues our author, "will here observe, that the form of the box now described is as plain as possible. It is, indeed, little more than five square pieces of board nailed together; so that a poor cottager, who has

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merely ingenuity enough to saw a board into the given dimensions, and to drive a nail, may make his own boxes without the assistance of a carpenter.—The two boxes differ from each other only in this, that the side of communication of the one must be on the right hand; that of the other on the left."

After observing that no true lover of bees ever lighted the fatal match without much concern; and that it is evidently more to our advantage to spare the lives of our bees, and be content with part of their stores, than to kill and take possession of the whole, Mr. White lays down the following plan for the preservation of these industrious creatures:—"About the end of August, by a little inspection through the glasses, we may easily discover which of the colonies may be laid under contribution. Such as have filled a box and a half with their works will pretty readily yield the half box: but we must not depend upon the quantity of combs without examining how they are stored with honey. The bees should have eight or nine pounds of honey left them as a remuneration for their summer's work.—The most proper time for this business is the middle of the day; and no armour is required, except a pair of gloves. The operation should be performed thus:—Open the mouth of the box intended to be taken; then with a thin knife cut through the resin with which the bees have joined the boxes together, and thrust in a sheet of tin, to stop the communication. The bees in the fullest box, where the queen is most likely to be, will be rather disturbed at this operation; but those in the other box will run to and fro in the utmost confusion, and send forth a mournful cry, which may be plainly distinguished from their other notes. They will

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also issue out at the newly opened door, by one or two at a time, and in visible disorder. But this is soon over; for as soon as they get abroad and discover their companions, they immediately join them at the mouth of the other box. By this means, in about a couple of hours, a box of pure honey may be got without leaving a bee in it; and likewise without any dead bees, which, in the old practice of burning them, are frequently mixed with the honey, which is consequently both wasted and damaged."

Mr. Wildman, whose remarks on the management of bees are pretty generally known, possessed a secret by which he could cause a hive of bees to swarm upon his head or shoulders, in a most surprising manner; and he has been seen to drink a glass of wine with the bees all over his head and face, more than an inch deep. It is also said, that he could act the part of a general with them, by marshalling them in battle array upon a large table. He divided them into regiments, battalions, and companies, according to military discipline; and on his uttering the word *march!* they began to move very regularly, in the manner of soldiers. He even taught his bees so much politeness, that they never attempted to sting any of the numerous visitants who frequently resorted to admire so interesting a spectacle.

Of the Galéode araneoïde, or scorpion spider, found in several parts of the Levant, M. Sonnini has given the following description:—"Some very prominent characters approximate this insect to the phalangium: its head is, in like manner, confounded with the corselet, and the piece of which they are composed is nearly in the form of a truncated cone, whose base is placed in front, and

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serves as an anterior border: in the middle of this border is a tubercle with two eyes; and between them are two other little tubercles, which might also be taken for eyes, but I consider them rather as peduncles of eye-lashes, or thick hairs, some of which, if examined with a magnifying glass, appear truncated and tubular.

"To this piece, which supplies the place of head and corselet, are attached the organs of nutrition, and two pair of arms or feelers. The jaws are of a conical form, and are larger than the head, in front of which they are fixed: they adhere to each other by their inner-side; and each of them is terminated by two brown nippers, scaly, notched underneath, bowed in a contrary direction, and crossing each other at their extremity. I discovered no opening that could serve as a drain for poisonous liquor, as is generally perceived in the claws of spiders; yet it is very certain that this insect is extremely venomous, which leads us to suppose that the holes through which its venom is emitted are extremely small, and that the poison which exudes from them is of an extremely active nature, since even the minute portion which can flow from an imperceptible opening is sufficient to occasion death.

"At the origin of the nippers, is a small cylindrical net, terminated in a point, thrown back, and laid on the mandible: but I presume that this appendage is merely one of the distinctive characters of the sex. Underneath these mandibles is a small body, which Fabricius calls a lip in the form of a sucker. This body seems to be composed of a little shank, having at its extremity two cylindrical, hairy pieces, close to each other.

"The arms or attennulæ, which are inserted in

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the lower part of this piece, are composed of a series of joints, almost all cylindrical, beset with long hairs, and fashioned much in the same manner, except that the anterior arms are larger, and have a knob, or short round joint, at their extremity, which is supposed to indicate a male.

"Between the belly and the corselet is an intermediate piece, serving as a fastening to four pairs of feet, that differ essentially from the arms, by having a tursus, consisting of two or three joints, at the extremity of which are two toes, bent, long, and provided with small scaly hooks. The feet, reckoning from those nearest to the arms, successively increase in size; so that the last are very long. On the lower side of the part which, by comparison with other animals, might be called the hip, are four remarkable appendages: these are thin, membraneous bodies, formed by a small pedicle, which is surmounted by a piece almost triangular, bent, and concave. A better comparison cannot, indeed, be made of these appendages than to the half of a funnel which has been cut in its height: they approximate the galèodes to the scorpion, which has two bodies in the form of a comb, placed near the hind feet.—The abdomen is joined to the piece which answers to the corselet; not by a short pedicle, as in spiders, but by its greatest transversal diameter; it also differs from the abdomen of spiders, in having incisions or rings, whereas that of spiders is whole and continuous.

"The galéode, whose length is about an inch, has a body of a livid yellow colour, and bent, in several places, with long, prickly hairs. It runs with prodigious swiftness, and thus more easily eludes destruction; but it is the interest of man-

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kind to pursue it with avidity, as its bite is very dangerous, and its venom extremely subtle. The part which is bitten swells in an instant, and occasions excessive pain, which is infallibly followed by death, if proper remedies be not immediately employed. Those which are most effectual are oil, as a topical application, together with cordials and sudorifics, taken internally."

The same traveller informs us, that he procured, in the canal of Rhodes, a species of muræna, which is commonly called the sea-serpent, because it has not only the form and quick movements of a serpent, but also the beautiful variety of colours which adorn that reptile.—The head of this fish is elongated, compressed on the sides, and diminishing perceptibly in thickness to the rostrum, which is almost pointed. The opening of the mouth is large; the jaws are flattened throughout their length, and with respect to their form, they may be properly compared to the bill of a goose.

The inside of the jaws is furnished with a formidable set of teeth, of unequal size and different forms, some being small and straight; others long, moveable, and bent towards the bottom of the mouth. All the inside of the upper jaw is armed with these teeth, which grow larger towards the middle; but the under jaw has none except on the edges.—At the extremity of the upper jaw are some short, broad, and fistulous appendages, which are supposed to be the organs of hearing. The eyes are small, and placed much nearer to the extremity of the upper jaw than to the angles of the mouth: they are covered by a bluish, transparent pellicle, and the pupil is surrounded with an orange-coloured circle. The apertures of the nostrils are placed very near the eyes, and there is another

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small orifice near the gills, which serves for the ejection of the water.

The body of this muræna nearly resembles that of an eel; but it is shorter and more compressed on the sides, and has neither pectoral nor ventral fins. An elevated fin runs along the back, surrounds the tail, and terminates beneath, near the anus: this fin is covered throughout its whole extent by the skin of the body.

The smooth and slippery skin of this fish is very diversified in its colours. The rostrum is blackish at its extremity; the head and upper part of the body are of a reddish brown, spotted with yellow; and the belly and sides, together with the lower part of the under jaw, are of a fawn colour, variegated with brown lines and spots.

The stomach, which is remarkably capacious, is of a grey colour, and spotted at its orifice: the liver is long, and of a red hue, tinged with yellow; and the air-bladder is small, oval, and formed of a very thick membrane: its colour is yellow without, and white within.—The Greeks of the islands of the Archipelago call this creature *sminaria*, and affirm that it couples with the land serpent: this, however, is a vulgar error; for, as the species of muræna is composed of males and females, they have no occasion to seek auxiliaries of that nature in a foreign element.

In order to draw these fishes from among the rocks, the fishermen use a species of very small fishes, called athemos: they chew these raw, and when they have reduced them to a kind of paste, they throw them into the sea; and the muræna, being attracted by the smell of this food, come immediately to the hook.—Their flesh is very white and delicate; but the quantity of short and

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crooked bones with which it is filled, renders it troublesome to be eaten. It is asserted, however, that the fishermen of the Levant have an art of causing these inconvenient bones to descend to the tail, by squeezing the body of the fish between two small sticks, and of taking them off with the skin.

The fangri of the modern Greeks holds a middle place between the sea-bream and the silvery-eyed, red sparus, and is sufficiently different from both to constitute a distinct race, which probably owes its origin to the difference of climate. "Gold and purple," says M. Sonnini, "glitter on its scales; but, like the fleeting lustre of beauty, which the slightest derangement causes to vanish, this luxury of colours is effaced as soon as the fish is taken out of its natural element: nothing then remains but tints without brilliancy, vestiges that cease to flatter the eye; and if, in hope of preserving these remains, already so faded, recourse be had to the common method of plunging the animal into a spirituous liquor, it immediately changes colour, and becomes entirely livid."

The head of the fangri is short, and remarkably solid; and its form indicates great strength in this part, as its strong jaws, armed with sharp teeth, denote its voracity. The mouth is small; the lips are fleshy, thick, and moveable; and on the fore part of each jaw are four long hooked teeth, which stand apart from each other, and have behind them, both above and below, a number of small loose hooks, longer in the upper jaw than in the under one. At the end of these are five other short teeth, broad at the base, and terminating in a point; and beyond them is a double row of teeth, in the shape of large tubercles, which may be properly compared to the grinders of quadrupeds.

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The back and belly of the fangri are convex, the sides flattened, and the extremity of the body is thick and slightly rounded. The fin, which extends entirely along the back, consists of twenty-three rays, twelve of which are prickly; the pectoral fins are remarkably long, terminated in a point, and formed of fifteen rays; the pinna ani has eleven rays; and the ventral fins have six rays, the first of which is terminated by a fine point, and the second is the largest of all. The scales are broad and thin, and adhere so closely to the flesh, that it is very difficult to detach them.

We have already observed that the fangri is extremely rich in colours.—Its eyes are of a brilliant brown yellow, with some faint spots of white and orange colour; and at the anterior angle of each eye is a large spot of shining gold; the head is of a reddish brown; the operculæ of the gills are of a fine grey, with reflexions of silver and gold; and the upper part of the body is of a fine cherry colour, that grows paler on the under part, which is likewise covered with silvery scales, and has a bright red spot in the middle, which produces a very handsome effect.

It is necessary, however, to remark, that the difference of age produces some variation in the colours of these animals; for in proportion as they grow old, the tints become pale, and their brilliant reflections fade away. M. Sonnini observed one in the Levant, which had a very remarkable irregularity; it had on the left side of the rostrum, a large black spot, but had no trace of any on the right side. The skin of this individual was livid; all its colours were tarnished, and it appeared to be either very old or sickly.

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The fangri is a voracious and solitary fish, generally residing in the holes of the rocks.—It grows to a considerable size, and has sometimes been found to weigh upwards of fifty pounds.

ANTIQUITIES.

THE remains of antiquity to be met with in that part of the Turkish dominions we are now surveying, especially in Greece and some of the neighbouring islands, are almost innumerable; but we shall endeavour to give a description of such as have chiefly engaged the attention of travellers, beginning with those of Constantinople, the capital of the Ottoman empire.

The Hippodrome, or Place for Horse-races, is a famous square in that city, now called *Atmeidan* by the Turks, which is almost a translation of its ancient name, *At* in their language signifying a Horse, and *Meidan* a Place *. It is still of the same dimensions as it was formerly, viz. about four hundred and fifty paces in length, and a hun-

* According to M. Tournefort, this place is put almost to the same uses it was originally; for on Fridays, when the service at the mosques is over, the Turkish youth, well dressed and mounted, assemble together to exercise themselves in feats of horsemanship. They divide themselves into two companies; and on a signal given, one starts from each end, riding full-speed with a long kind of dart in his hand. Each throws his dart at his adversary, and the other endeavours to avoid it; in which consists the excellency of the performance. Their horses are very swift, and the riders manage them with surprising address and dexterity.

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dred in breadth; but of all its fine ornaments, there are now only two remaining. The first is an obelisk of granite or Thebaic marble, of a single piece, about fifty feet high, terminating in a point, and charged with hieroglyphics, now unintelligible; a proof, however, of its being very ancient, and wrought in Egypt.

This obelisk stands upon four little brazen pillars, upon a pedestal eight or ten feet high, on which are two inscriptions, the one in Greek, the other in Latin, importing that the emperor Theodosius caused it to be set up again, after it had lain upon the ground a considerable time; that the engineer who undertook this task was named Proclus, and that he completed it in two and thirty days. Each side of the pedestal is likewise adorned with curious bass-reliefs, one of which, on the north, represents the workmen and machines whereby the obelisk was raised, and also the obelisk itself, both upright and lying upon the ground. Another range of sculptures below, represents the Hippodrome as it was formerly, with two obelisks, two men on horseback, and several people on foot. On the south side of the pedestal are carved four chariots, two of which are drawn by a pair, and the others by four horses, with each of them a driver; and on the same side are twenty or thirty figures clothed in gowns, with others in a fighting posture, armed with bucklers. On the east side is represented a promiscuous company of men and women, dancing, and playing upon musical instruments of several kinds; and higher up are two ranges, whereof little appears but the heads, which were probably intended for the spectators. The west side is adorned with figures in a suppliant posture, offering various presents to the empe-

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ror Theodosius, who is seated on a throne, with his two sons, Honorius and Arcadius, and attended by his nobles. This obelisk had formerly on the top of it a brazen pine-apple, which was thrown down by an earthquake, as we are informed by Nicetas, in his life of St. Ignatius, patriarch of Constantinople.

At the opposite end of the Hippodrome is another obelisk, consisting of several pieces of white marble, and raised upon a pedestal of the same; but when Sir George Wheler saw it, in 1675, the top of it was broken off, and the rest seemed ready to fall. M. Tournefort, who was at Constantinople in 1700, gives the same account of this obelisk, and adds, that it was formerly covered with plates of brass, which he supposes were adorned with bass-reliefs and other ornaments, an inscription on its base representing it as a very wonderful work, and made still more beautiful by the emperor Constantine, the son of Romanus.

Between the two obelisks we have been describing, stood a pillar of brass, about fifteen feet high, representing three serpents twisted spirally round each other like a roll of tobacco, the wreaths diminishing gradually from the base to the top, where the heads of the serpents parted different ways, bending outwards in a triangular form. In the year 1700 the pillar was thrown down, and the heads broken off and carried away; and some years afterwards the pillar itself was removed, but what is become of it we are not able to say.—The history of this column is very uncertain; but there is great reason to suppose, with M. Tournefort, that it was brought originally from Delphos, where it served to support the famous golden tripod of Apollo. Sir George Wheeler conjectures, that

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it was anciently placed on the top of the obelisk last described.

In the great street leading to Adrianople, stands the Burnt Column, as it is now called, being so black and scorched by the frequent fires that have happened near it, that one can scarcely discover what it is made of: upon a narrow inspection, however, it appears to be composed of several pieces of porphyry, the joints of which are bound about with rings of brass. It is raised upon a square marble pedestal, every way four yards broad, and six yards high; and towards the top of it there is a Greek inscription, implying, that this admirable piece of workmanship, being ruined by time, was erected anew by the emperor Manuel Comnenus, who reigned in the twelfth century.

This pillar is supposed to have been brought from Rome by Constantine the Great, who caused a beautiful brazen statue of Apollo to be placed upon it, and called by his own name; which statue, according to history, was either struck down by lightning, or blown off and demolished, several persons being dashed to pieces by its fall. In fact, the column, though very ancient, has not suffered so much by the ravages of time, as by fires, storms, and earthquakes.

In a part of the city, lying south from the Hippodrome, formerly stood the Historical Pillar, so called, because it was entirely covered with bass-reliefs, representing the victories of the emperor Arcadius. The conquered towns were denoted by figures of women, whose heads were crowned with towers; and amongst them the emperor appeared sitting in a kind of elbow-chair, with two angels over his head, supporting the labarum

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or standard of the Christian emperors. The sculptures were much better than most performances of the same date; that is, in the declension of the Roman empire. The horses in particular were finely executed; and the artist had taken great pains to make the figures appear of an equal bigness to the eye at all the distances, those near the top seeming just as large as those at the bottom. This column was of plain white marble, but blackened and disfigured by fires, as well as the former. It was a hundred and forty-seven feet high, and had a flight of winding stairs within it, but so much broken and decayed, that they were entirely useless.

In a private court-yard about half way between the Hippodrome and Adrianople gate, is a pillar erected to the emperor Marcian by Tatianus, as appears from an inscription on the pedestal, who was undoubtedly the same that assured Marcian, when he was only a private soldier, that he should live to be advanced to the imperial throne; and the event having verified the prediction, he made Tatianus governor of Constantinople. This column is of granite, and has an urn of white marble on the top or it, wherein Marcian's heart was probably deposited; and it is supposed a statue of that emperor was placed upon the urn, as the above-mentioned inscription seems to intimate.

The Castle of Seven Towers forms one of the angles of Constantinople, and is the first building on the land side which catches they eye, in approaching by the Propontis or White Sea. It was anciently one of the city gates, and had only four turrets; but Mahomet II. becoming master of the place, added three new ones, converted it

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into a castle, and made it a depot for the treasures of the empire. At present, however, it is only used as a s ate prison, where the grand signior confines such of his officers as happen to incur his displeasure.

Chishull observes, that the remains of the gate are still truly admirable, though suffered to be almost concealed by a dead wall, and the shade of some neighbouring trees. It is a regular arch of white marble, supported by two beautiful pillars, adorned with sculptures of military achievements, and flanked with twelve tablets of carved work, representing several poetical stories. Among the rest are those of Hercules and the Nemean-lion; Luna and Endymion; a winged Pegasus managed by the muses; a portraiture of the combat of whirlbats, and a fine imperial figure. M. Thevenot tells us, that several persons of note have been strangled within the walls of this castle.

About six miles from the Turkish capital are some famous aqueducts, built by Valentinian, and afterwards repaired by Solyman the Magnificent. The most remarkable of these forms three lofty fabrics, that are built over as many valleys between the hills, in order to carry the water from one hill to another, till it reaches the city. As these valleys are extremely deep, and as no arch could raise a structure to the proper height, one bridge is erected upon another, arch over arch, till the top of the bridge is on a level with the mountain from which the water flows.—On this upper bridge is a canal to convey the stream, and on each side is a colonnade for the convenience of foot passengers.

These aqueducts, which supply Constantinople with water, often serve as a boundary to the ex-

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cursions of the Turks; but it is neither to admire the architecture, nor to judge of the salubrity of the waters, that they go thither in crowds. But they usually carry refreshments with them, and take their feast in some ruined kiosks, which the emperors built at the same time with the edifices, that were designed to collect the rain-water, and convey it to the metropolis.

The antiquities of Athens are still so numerous, notwithstanding the ravages that time and barbarism have made among them, that they exceed those of any city in the world, Rome only excepted. That which claims our first attention is an ancient temple of Minerva (now a Turkish mosque) which is all built of white marble, and is, perhaps, the most beautiful piece of antiquity now in being. It is about two hundred and eighteen feet in length, and ninety-eight in breadth; and has on every side an ascent of five steps, that seem contrived as a basis to the portico, which is supported by channelled pillars of the Doric order, running all round the temple. These pillars are forty-six in number, two and forty feet high, and seventeen feet and a half in circumference. The front and frize round about the temple were charged with historical figures of admirable workmanship, many of which were standing about a hundred years ago.—The back front was adorned with figures representing the contest between Neptune and Minerva, about naming the city of Athens; but they are all fallen down. The architrave was also charged with bass-reliefs, cut in squares at several distances, which represented the wars of the Athenians, particularly their victory at Marathon, and that over the Gauls in Mysia.

Within the portico we see a range of sculptures, which are undoubtedly coeval with the temple it-

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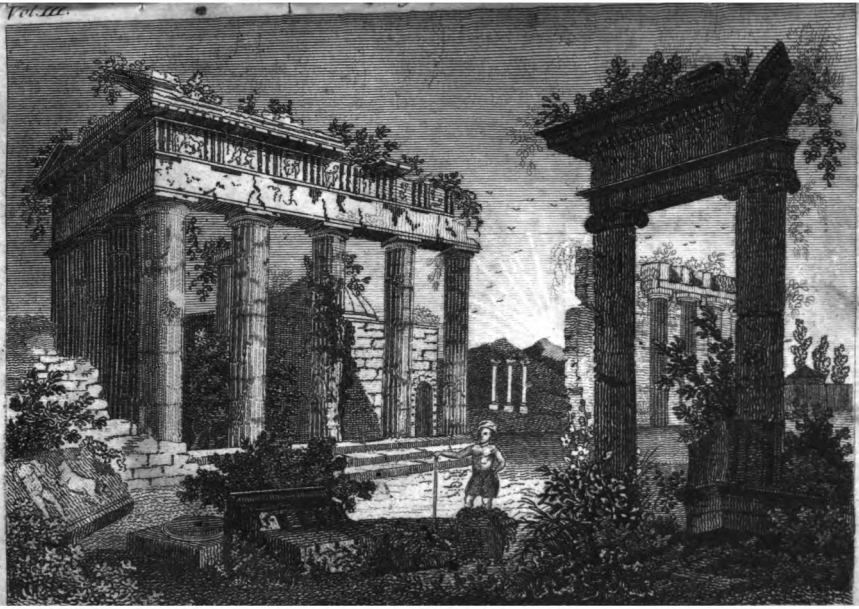

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self, and of excellent workmanship, representing sacrifices, processions, and other ceremonies of the heathen worship. This, like other Pagan temples, was almost entirely dark within, having no other light but what came in at the doors; but there is now a window at the east end of it, which was made by the Greek Christians when they were in possession of it, and used it for divine service. Towards the bottom of this window are several stones, which admit through them a yellowish light, and have been said to shine in the dark, but are in reality only a kind of transparent marble *.

As to the founders of this beautiful temple, the body of it was built by Pericles, to which Attalus added the magnificent portico: but the emperor Adrian most probably repaired it, and adorned it with the figures on each front; for the whiteness of the marble, and that emperor's statue among the figures, plainly show those sculptures to be of a later date than the temple itself.

Not far north from the temple of Minerva stands that of Erectheus, which is a sort of double building, as Pausanias describes it, through the lesser part whereof we enter into the larger. The roof of the large building is supported by channelled Ionic pillars, but the capitals seem to be a mixture of the Doric and Ionic orders.—On the

* This is the sort of marble, as Sir George Wheeler observes, which Pliny calls Phengites; and the temple of Fortune, built by Nero, was of this stone, which by its transparency supplied the want of windows, so that the inside received light enough, even when the doors were shut. It was anciently found in Cappadocia, but it is far from being peculiar to that country, very beautiful pieces of it having been found in France, Germany, and some parts of England.

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south side of Minerva's temple are some ancient ruins, with some statues of women in the walls, which Dr. Spon imagined to be the Graces. They are clothed, indeed, contrary to the usual manner of representing those deities; but that the Graces were not always represented naked, appears from Pausanias, who has described their statues and temple.

Descending from the Acropolis, or castle, in which are the antiquities already mentioned, we come to the remains of the theatre of Bacchus, the ancient seats of which are ruined; but their situation and distance from each other, may still be discerned. The front towards the sea has best escaped the injuries of time; for there are three rows of arches remaining, one above another; but the semicircular area below the seats, and the scene, (or that part of the theatre assigned for the actors) are almost filled with the ruins of the rest of the building. The whole structure was of white marble, and anciently adorned with the statues of Menander, Euripides, Sophocles, and Æschylus, their most celebrated dramatic writers.—At a little distance from the theatre, the foundations of some arches are to be seen, supposed to be the remains of the portico of Eumenes, where the actors learnt their plays by heart, and the citizens used frequently to walk for the sake of the air and conversation *.

In the side of the rock whereon the castle stands, is a little church, or rather grotto, the front of

* From their disputing as they walked under the porticos of the Lyceum at Athens, the disciples of Aristotle were called Peripatetticks; and from Zeno's teaching under a portico or piazza, which the Greeks call Stoa, his followers obtained the name of Stoics.

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which is adorned with three marble pilasters of the Corinthian order, sustaining an architrave of the same, with a mutilated figure on the top of it, and several Greek inscriptions, from whence it is supposed to have belonged to a gymnasium, or to have been a monument erected in honour of such as had been victors in the gymnastic exercises, which were wrestling, running, throwing the quoit, and several others, contributing either to the preservation of health, the defence of the body, or mirth and recreation.

To the south-east of the castle are yet standing seventeen beautiful columns of the Corinthian order, called Adrian's pillars, as supposed to be the remains of that emperor's palace, which was probably the greatest ornament of Athens when the structure was entire. They are of admirable white marble, above fifty feet high, including the capitals and bases, and about eighteen feet in circumference. It appears, however, from a view of the place, that there were originally six rows of them, twenty in each row, which supported a portico of surprising beauty and magnificence, inclosed within a cloister, wherein were several little rooms, whose cielings were of alabaster gilt, and the whole adorned with fine statues and paintings.—Pausanias likewise mentions an excellent library collected by Adrian, and a gymnasium bearing his name, of which no vestiges can now be seen; but there are some remains of an aqueduct begun by that emperor, and finished by Antoninus Pius, as appears from an inscription on an architrave supported by two Ionic pillars*.

* Aqueducts were not common at Athens before the time of the Romans, the want of them being supplied by

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At a short distance stands the temple of Theseus, another noble monument of antiquity which, as to its matter, form, and order of architecture, exactly resembles that of Minerva. With respect to the workmanship, it may be deemed a masterpiece; nor is it easy to be paralleled, much less exceeded, by any other structure. Within the portico, at the west end, is a bass-relief, representing the battle of the Centaurs; and at the east end there seems to be a continuation of that history: there are likewise several figures of women, which Mr. Vernon supposes to be Pirithous's bride, and the other ladies who attended at the wedding. On the outside of the portico, in the spaces between the triglyphs, are represented several feats of Theseus, in wrestling, where all the locks and postures of that art, in which he excelled, are admirably well expressed. He is also exhibited as encountering bulls, bears, and other animals: but time has greatly injured many of these figures, the temple having been built soon after the battle of Marathon, when the Athenians, under the conduct of the brave Miltiades, gained a most signal victory over the Persian army, about five hundred years before the birth of our Saviour.

The tower of Andronicus, or Temple of the Eight Winds, is yet standing at Athens, and is worth a traveller's observation. It is an octagonal structure, on each side of which is a winged figure, representing one of the winds, with the name written over it in Greek capitals; and underneath

wells, some of which were dug by private persons, and others at the public expence. At present the town is well furnished with water, brought by subterraneous aqueducts from the rivers Ilissus and Eridanus, and conveyed to many private houses, as well as to common fountains.

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these figures, only separated from them by a frize, are so many sun-dials, accommodated to the different sides of the tower. The roof of the building consists of little planks of marble, broad at bottom, but meeting in a point at top, so as to form a kind of pyramid of more than thirty sides; on the summit of which there was formerly a brazen Triton, with a switch in his hand, pointing to the quarter whence the wind came; but this weather-cock is long since destroyed. The figures are of excellent workmanship, each expressing the nature of the wind it is intended to represent.

In the south-west part of Athens stands a beautiful little structure, commonly called the Lantern of Demosthenes, on account of a tradition, that the orator shut himself up there, in order to pursue his studies without interruption, having first cut off one half of his beard, the more effectually to restrain himself from appearing in public: but the real design of this piece of antiquity will best appear by considering its form and ornaments.

It is a round edifice of white marble, only six feet in diameter within, and shaped so much like a lantern, that it is no wonder it has obtained that name. The roof is supported by six fluted columns of the Corinthian order, nine feet and a half high; and the intermediate space is taken up with pannels of marble, of one stone from the top to the bottom. The frize above the columns consists of one circular stone, and another entire stone forms the roof or cupola, which is carved so as to resemble scales lying one over another, and crowned with a sort of stem, like the socket of a candlestick, or rather (as Mr. Vernon represents it) like a plume of feathers.

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On the frize are beautifully represented in relievo, several of the labours and exploits of Hercules, as is judged from some of the figures being clothed with lion's skins. There is also an inscription on the frize, which gives some reason to conjecture, that this fabric was a temple dedicated to Hercules, by those who had been victors in the public games. Be this as it will, it is evidently of great antiquity, and appears to have been built above three hundred and thirty years before the Christian era.

Some remains of the Odeum, or Music-theatre, built by Pericles, are still to be seen, being the foundations of a semicircular structure, about a hundred and forty paces in diameter. Within the area is a square elevation, five or six feet high, with steps to the top of it; and on each side are several stone-benches, supposed to have been intended for the musicians. From these seats, however, Sir George Wheler seems rather to think this was the place where the senate or court of the Areopagus used to assemble, which was so famous for its antiquity, and the justice and impartiality of its decrees.

The time of the institution of this tribunal is not known, some referring it to Solon, and others carrying it as high as Cecrops; nor are authors agreed as to the reason of its name, or the number of persons of which it was composed. Its reputation was certainly very great, not only in Greece, but among foreign states, and even among the Romans themselves, who often submitted their most difficult causes to its decision. This assembly sat in the open air, as was anciently the custom in all courts of judicature that had cognizance of murder; partly because it was unlawful for the accuser and

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criminal in such cases to be under the same roof; and partly that the judges, whose persons were reckoned sacred, might not be polluted by conversing with malefactors. They also heard and determined causes in the night-time, that they might be the less diverted from their attention to the business in hand; and all pleadings before them were to be simple, without exordium, or digression.

There are several other noble monuments of antiquity to be seen at Athens, particularly the remains of a Stadium built by Lycurgus, and enlarged by Herodes Atticus; which was of such a stupendous size, according to Pausanias, that it looked like a mountain of white marble. Very little of the stone-work is at present remaining, but its form and dimensions may yet be discerned.

"The remains of the temple of Jupiter Olympus consists of large fluted columns of the Corinthian order, with a few massive marbles beneath, which many revolving ages have gradually consumed, and reduced into a very narrow compass. "These columns," says Dr. Chandler, "are of very extraordinary dimensions, being about six feet in diameter, and near sixty in height. Seventeen were standing in 1676; but a few years before our arrival, one was overturned with much difficulty, and applied to the building a new mosque in the bazar or market place. It was an angular column, and of consequence in determining the dimensions of the fabric. We therefore regretted that the fall of this mighty mass had not been postponed until we came, as it would have afforded an opportunity of inspecting and measuring some members which we found too lofty to be attempted.

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"On a piece of the architrave, supported by a couple of columns, are two parallel walls of modern masonry, arched about the middle, and again near the top. It is said to have been the habitation of a hermit; but of whatever building it has been part, and for whatever purpose designed, it must have been erected thus high in air, while the immense ruin of this huge structure was yet scarcely diminished, and the heap inclined, so as to render it accessible.

"It was remarked, that two stones of a step in the front had coalesced at the extremity, so that no juncture could be perceived; and the like was also discovered in a step of the parthenon: a circumstance which may be attributed to a concretory fluid which pervades the marble in the quarry.

"Besides the more stable antiquities, many detached pieces are found in the town, by the fountains, in the streets, the walls, the houses, and the churches. Among the most remarkable are a marble chair, which probably belonged to the gymnasium; a sun-dial at the cathedral, inscribed with the name of the maker; and a curious vessel of marble, now used as a cistern, but supposed to have formerly served as a public standard or measure.

"A custom has prevailed of fixing over the doors and gateways, carved stones, most of which represent the funeral supper. In the courts of the houses lie many round pillars, once placed on the graves of the Athenians; and a great number are still to be seen applied to the same use in the Turkish burying-ground before the acropolis. These generally have concise inscriptions, containing the name of the defunct, and of the town

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and tribe to which he belonged; but some of them are adorned with sculpture, and have an epitaph in verse.—Here also are a few mutilated Hermæ, or brazen busts on long quadrangular bases. These were, at first, made to represent only Hermes, or Mercury, and were designed as guardians of the Athenian sepulchres; but, after some time, the houses, streets, and porticos were adorned with them, and rendered venerable by a multitude of portraits of illustrious characters, heroes, gods, &c."

At Corinth, and about the neighbouring Isthmus, so famous for the solemn games there celebrated by the ancients *, some remains of antiquity are yet to be discovered, but none so entire as those we have been describing. Sir George Wheeler takes notice of very few in Corinth itself, and the chief of those are only ten or eleven pillars standing upright, which, from their situation, he judged to have supported the portico of some temple. They are of the Doric order, fluted, and of a common hard stone; but their proportion seems to vary considerably from the rules of the ancients, their circumference being eighteen feet, and their height not much above twenty. On the north side of the market-place there is also a heap of ruins of brick-work, sup-

* The Isthmian games, in honour of Neptune, were solemnized every fifth year with incredible magnificence, and drew together a prodigious concourse of spectators from all parts of Greece. The victors were at first rewarded with garlands of pine-leaves, but afterwards with a wreath of parsley, which was also the reward of the Nemean conquerors; whereby the institutors of those games undoubtedly intended to intimate, that honour should be the only motive of great actions and undertakings.

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posed to be either part of a temple, or of a Roman bath.—At mount Oneius, on the Isthmus, are to be seen the ruins of the town, of the Isthmian theatre, and of several stately temples and other edifices mentioned by Pausanias; and in many places may be discerned the foundations of the walls built by the Lacedæmonians from one sea to the other, to prevent the incursions of their enemies. They were repaired by the Venetians when they were in possession of the Morea, but have been since destroyed.

In the island of Delos, which was famed among the ancients for being the birth-place of Apollo and Diana, was a magnificent temple dedicated to Apollo, which is now a vast heap of ruins, lying in such a confused manner, that it is impossible to determine so much as the form of that structure.

Amongst these ruins are the remains of a Colossal statue of Apollo, which has lost its head, arms, and feet; and the rest of it is broken into two pieces, the one consisting of the belly and thighs, the other of the back and shoulders. The back is two yards broad, and the other parts proportionably large; so that it was probably placed on the frontispiece of the temple, and appeared no bigger than the life, from whence one may judge of the height of that edifice. This statue appears to have been an admirable piece of sculpture, the ringlets of hair falling down the shoulders being particularly beautiful. A large piece of marble, fifteen feet and a half long, ten feet nine inches broad, and two feet three inches thick, is to be seen among the ruins, which was undoubtedly the plinth of this gigantic statue, an inscription upon it, showing that it was dedicated to Apollo by the people of Naxos.

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At a small distance from this statue Sir George Wheeler found half the body of a woman, the drapery whereof was carved so well, that it seemed to be the work of no less a master than the former. Just by this he saw the body and fore part of a Centaur, on which the sculptor had so well displayed his skill, that life and vigour appeared in every vein and muscle. The head and neck of a horse, part of the figure of a woman, and several fragments of lions, are also found in these noble ruins, which in general consist of huge pieces of broken columns, architraves, bases, capitals, &c. all mingled together in the utmost disorder and confusion.

At a small distance from the ruins of this temple lie those of a portico, which, from an inscription, appears to have been erected by Philip, king of Macedon, and consists of columns and architraves truly magnificent. These architraves have escaped breaking and carrying away, being inchased into the tops of the columns, which are angular towards the base, and channelled upwards, composed of several pieces, and of the Corinthian order. Each architrave is one foot eight inches deep, ten feet in length, and two and a half in thickness, and the largest diameter of the columns is two feet four inches.

About three hundred paces from this portico are some remains of a beautiful marble theatre, whose circumference is five hundred feet, and its diameter, including the steps, two hundred and fifty. Just before the opening of the theatre are eight or nine vaults in a row, separated from each other by a wall, in which there is a little arch, serving for a passage from one to another. Dr. Spon imagined them to have been a kind of cis-

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terns or reservoirs of water, but they were more probably intended to keep lions and other wild beasts in, which used to be baited in the theatres of the ancients. These cellars were not arched over, but covered with huge pieces of marble cut like beams, with proper openings to let in the light, and to bring the animals in and out.

Near the foot of mount Cynthus, which runs almost across the island, are nine pillars of marble disposed in a circle, three standing upright, and six fallen to the ground. This edifice had a mosaic pavement, and underneath these columns most beautiful vaults have been discovered.

Mount Cynthus is steep and craggy, consisting of little else but a kind of greyish marble; and Sir George Wheeler imagines, that the way up the mountain (which is deep, broad, and winding) was originally a quarry from whence the marble was dug, as it resembled many quarries he afterwards saw in Attica. On the top of the hill are to be seen the foundations of a citadel which commanded the whole island; and all the way up, on each side of the road, it appears to have been formerly adorned with temples, porticos, or other structures, as the foundations of walls, and a vast number of columns, pedestals, architraves, and other fragments of excellent marble, sufficiently demonstrate.

In another part of the island, not far from the sea, there are still standing six or seven pillars of granite, which the people of the neighbouring islands call the School, from a tradition that there was anciently a Gymnasium in that place. Between twenty and thirty columns are lying upon the ground near those which are standing, most of them nine or ten feet high, but of different diame-

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ters, and seem to have supported a square structure; but whether it was a gymnasium cannot now be easily ascertained.

About a hundred paces from this structure is an oval bason, almost three hundred feet long and two hundred broad, lined round with a wall as high as its banks, which is faced with a thick cement, proper to contain water. This is thought to have been a naumachia, or place for naval exercises; for though we have not the positive testimony of ancient authors, that sea-fights were represented at Delos, the bason seems evidently intended for that purpose. This bason is now half filled up with earth, and the rain-water settled in it is briny and almost bitter; which seem to argue that the cavity was formerly filled with sea-water, the salt and slime of which still remain in great quantities.

On a little eminence near this bason lie the ruins of some stately temple, if we may judge from the number of marble columns, half fluted and half pannelled, about two and twenty inches in diameter; and more especially from the fragment of an altar found amongst them, adorned with festoons, bunches of grapes, and heads of oxen. The upper part of this altar is somewhat hollow, proper for the burning of incense; and by this cavity we may distinguish altars from the pedestals of statues. These altars are frequent in Delos, and in the adjacent island of Rhenia *.

* In Rhenia (which is also called the Greater Delos) M. Tournefort says, he counted above a hundred and twenty altars; most of which were cylindrical, three feet six inches high, and near three feet in diameter, adorned with festoons, and the heads of rams or oxen.

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The remains of another noble structure are to be seen at the end of the bason which faces the temple of Apollo. A vast number of pillars appear to have formed a square as broad as the lesser diameter of the bason; and perhaps sustained a portico built by Dionysius Eutyches, an architrave and altar with that prince's name being found very near these ruins. Some of the columns are yet standing, but most of them are overthrown and broken to pieces. There are plain ones of twenty inches diameter, and others of eighteen cut in pannels, both intermixed with huge pillars of granite, with which mount Cynthus abounds.—From this portico to the Little Port of Delos the ground is covered with fragments of marble columns, altars, &c. which have such an appearance of magnificence, that they are probably the ruins of Latona's temple.

Among the magnificent ruins of Carthea, on the island of Ceos *, is an ancient temple, the columns of which have their shafts half plain and half fluted. From this temple there is a descent to the sea-shore by a noble marble stair-case; and at the bottom is a fine though mutilated statue, supposed to have been that of the goddess Nemesis.—In this island, also, are some remains of a road paved with flat stones, which extends about three miles in length, and is supposed to have been made when Greece was in its most flourishing state.

Near Mount Hæmus, or the Great Balcan, which borders on Romania, is a gate, said to have been erected by the emperor Trajan, in commemoration of his marching an army through the country, and opening a road through places before

* Now Zia.

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impervious. This stately monument consists of two stone pillars, with an arch over them, representing a large open gate, but it is now in a very ruinous condition.

The ruins of Gortyna cover a vast extent of ground, and enable travellers to form some idea of its magnificence, though such of its monuments as still subsist, are not of the highest antiquity. One of the most remarkable is a gate, built with large bricks, and formerly covered with free-stone. This edifice is of a considerable thickness, and presents a very extensive front; but it cannot be supposed more ancient than the walls of Gortyna, which were rebuilt by order of Ptolemy Philopator.—Beyond this gate is a large open space, in form of a parallelogram, and bordered on each side with a double row of marble pedestals, which seem to have formed part of the portico of a temple. Here also are several columns of marble and granite, buried up to the middle of their shafts, with their capitals lying on the ground. Near the extremity of these ruins, is a considerable portion of an ancient cathedral, supposed to have been founded by Titus, the disciple of St. Paul.

Among the ruins on the coast of Argentiera, are two large and beautiful tombs, with the opening of a subterraneous cave, in form of a well: here, also, are some fragments of ancient buildings, and passages of subterraneous galleries, in which it would be gratifying to descend and dig, if that were practicable without giving umbrage to a government, which has no idea of the importance of historic monuments. M. Sonnini observes, that he was shown a place of sepulture on this coast, whence some enterprising people had

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carried off medals, lamps, earthen vessels, little idols, and a statue of silver.

The temple of Jupiter at Egina, was of the Doric order, and had six columns in front. Twenty-one of the exterior columns are yet standing, with two in front of the pronaos and of the posticum, and five of those which formed the ranges of the cell. The stone is of a light brownish colour, eaten in many places, and indicating a very great age. Some of the columns have been bored to their centre, and the entablature, excepting the architrave, is fallen. This ruin Dr. Chandler considers as scarcely to be paralleled in its claim to remote antiquity: and its lonely situation, at a distance from the sea, has preserved it from total demolition, amidst all the changes that have taken place in the adjacent countries.

Near the shore is a barrow, raised, according to tradition, in memory of Phocus, the son of Æacus, who was killed by his brother Pellus. This barrow was preserved entire and unaltered to the time of Pausanias, and in a country depopulated and neglected, it may still endure for many ages.

BUILDINGS.

THOUGH the Turks affect nothing grand in the structure of their private houses, yet their mosques or temples, and other public buildings, are extremely magnificent. The royal mosques, in particular, are very beautiful and stately edifices, and are usually the first that engage the attention of a stranger after his arrival at Constan-

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tinople. These buildings appear to much more advantage than many of our finest churches, which (in London especially) are often so closely surrounded with houses and tradesmen's shops, that there is no room to view them at a proper distance; whereas the mosques of Constantinople stand single, within spacious inclosures, planted with trees and adorned with fountains. The domes are well executed in most parts of Turkey, especially those of the mosques, which are of an exact proportion, and accompanied with smaller cupolas, which set them off to the eye, and give them a noble and majestic appearance. The slender steeples or pillars called minarets, which are somewhat like the Monument in London, terminating in small spires with gilded crescents on the top of them, are also a great ornament to the mosques, as well as to the cities, many of them being of a noble height and bold workmanship.

The principal of the royal mosques is that of St. Sophia, which is advantageously situated on an eminence in one of the best and finest parts of Constantinople. It was formerly a Christian church, having been built in the sixth century by the emperor Justin, and afterwards enlarged and beautified by Justinian; and though the Turks have now converted it into a mosque, it still retains its ancient name. The length of this edifice is a hundred and fourteen paces, and its breadth eighty, having in the front a portico thirty-six feet wide, supported by marble columns, which in the time of the Greek emperors served for a vestibulum, where such persons were appointed to stand as intended to receive the sacraments, or undergo public penance. This portico has a com-

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munication with the church by nine stately folding doors, the leaves of which are brass, and adorned with fine bass-reliefs; and on the middlemost some figures of mosaic work may still be discerned. Another portico, parallel to this, has only five brazen doors without bass-reliefs, but formerly charged with crosses, which the Turks have defaced.

The body of the mosque is covered by a dome of admirable structure, at the foot of which runs a collonade, sustaining a gallery ten yards broad, which, when the Christians were masters of it, was set apart for the women; and over this are two smaller galleries, supported by columns and arches of excellent workmanship, answering to those below. The dome is said to be a hundred and thirteen feet in diameter, and is built upon arches supported by vast pillars of white marble. The incrustations of the gallery are mosaic, mostly done with little cubes of glass, which by time are continually loosened from their cement; but their colour is fresh and unchangeable. The form of the dome is that of a hemisphere or half-globe, and it is illuminated by twenty-four windows placed round it at equal distances. It was formerly adorned by four cherubims and other figures; but these have been defaced by the Turks, who do not admit of any imagery or painting in their mosques.

On the east side of this vast cupola is a demi-dome, which was the sanctuary or chancel of the Christians; and here is now a niche, wherein the Turks keep their koran, containing the revelations, doctrine, and predictions of their pretended prophet. This niche is in that part of the dome which stands towards Mecca, and the niches in

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all their mosques are placed in the same manner; for the Mahometans always turn their faces that way when they say their prayers.

At a little distance from the niche is the Mufti's chair*, raised on several steps; and on the side of it is a kind of pulpit, where certain prayers are repeated by persons appointed for that purpose. The Turks have been accused of pulling down some parts of this edifice since they took it from the Christians; but instead of this, they have added four of those tall, slender minarets before mentioned. Every royal mosque has at least two minarets, and one of them has six; but the ordinary mosques have seldom more than one. About the middle of these, on the outside, there are usually three balconies or galleries, one above another, to which the Imaums ascend by stairs within, and, with a shrill singing tone, give notice to the people to come to their devotions.

The mosque of St. Sophia has been generally represented as the noblest building in Constantinople; but Lady Wortley Montague observes, that there are others still more beautiful. That of Sultan Solyman is an exact square, with four fine towers in the angles. In the midst is a noble cupola, supported by fine marble pillars, and two smaller at the end, supported in the same manner. The pavement and gallery round the mosque are

* The Mufti is the high-priest or patriarch of the Mahometan religion, being the sovereign interpreter of the Koran, and the oracle of their law, to whom the last appeal is generally made in cases of importance. He takes place of the bashaws, and his authority has been often terrible to the Grand Signior himself. It is he that girds on the sword to the Grand Signior's side, which ceremony answers to the coronation of our kings.

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of marble; and under the great cupola is a fountain adorned with pillars of most beautiful colours.

On one side is a pulpit of white marble, and on the other a little gallery for the Sultan, which is ascended by a fine stair-case with gilt lattices. At the upper end is a kind of altar, where the name of God is written; and before it stand two candlesticks, five or six feet high, containing lofty wax candles. The windows are larger and better disposed than those of St. Sophia. The pavement is spread with fine carpets, and the mosque illuminated with a vast number of lamps. The court leading to it is very spacious, and encompassed with galleries, supported by columns of green marble; and on two sides, it is covered with twenty-eight cupolas, with a fountain in the middle. In all the mosques are little chapels, containing the tombs of the founders and their families; and behind this structure are the tomb of Solyman the Second, by whom it was founded, and that of his Sultana. Solyman's tomb is covered with a rich piece of embroidery brought from Mecca; and at the head of it is placed a tuft of feathers, adorned with precious stones. This mausoleum is illuminated with seven large tapers, and a great number of lamps are kept continually burning.

The mosque of Sultan Achmet, now called the Atmeidan mosque, as being near the Hippodrome, is so beautiful and magnificent, that it merits a particular description. It stands in the middle of a large square court, about twice as long as broad, on each side of which is a range of low buildings, covered with a series of small cupolas, which have a very pleasing effect.

From this court we pass into a square cloister adjoining to the western end of the mosque,

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having a piazza supported by ancient marble pillars of various colours, and also covered with little domes. This inner square is beautifully paved with marble, and has an hexagonal fountain in the middle of it, covered with a cupola of gilded wire. At the entrance of the mosque is a portico sustained by stately columns of marble; and folding doors of brass admit us into this noble edifice. The great dome stands upon four channelled pillars of white marble, which Sir George Whelet says are seventy spans in circumference; and to this are joined four half cupolas of the same diameter with the dome, but much lower. At each corner there is also a smaller dome, and six tall minarets contribute to the grandeur and beauty of the structure. The domes are covered with lead, and adorned at the top (as well as the minarets) with gilded globes and crescents, the symbol of the Ottoman empire *. The ornaments of the interior consist of balls of ivory, globes of crystal, lustres, &c. which make a glittering show when the lamps are lighted at evening service.

The Validea, so called from its foundress Valida, the mother of Mahomet IV. is another ma-

* The crescent was the symbol of the city of Byzantium (now Constantinople), which the Turks have only adopted. The device is of great antiquity, as appears from several medals, and took its rise from an event related by Stephens the geographer, a native of Byzantium. He tells us, that Philip, the father of Alexander the Great, meeting with mighty difficulties in carrying on the siege of that city, set workmen in a very dark night to undermine the walls, that his troops might enter the place without being perceived; but, luckily for the besieged, the moon appearing, discovered the design, which accordingly miscarried. In acknowledgment of this deliverance, the Byzantines erected a statue to Diana, and thus the crescent became their symbol.

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jestic edifice, which seems to exceed the other mosques in the delicacy of its architecture. It has a square court before it, like the inner one of Achmet's, with a fountain in the middle, and a piazza running round it, sustained by beautiful columns of marble, most of them fetched from the ruins of Troy or Alexandria, particularly two of jasper, which are placed at the entrance of the mosque, and are admirably well polished and proportioned. The arches of the doors and windows are well designed, and the walls and pillars within are faced with blue and white tiles. This mosque has two minarets, each of which is encompassed with three handsome galleries; and these are finely illuminated on occasions of public rejoicing. Lady Wortley Montague observes, that this is the largest of all the mosques of Constantinople; that it is the most beautiful structure she ever saw; and that St. Paul's cathedral at London would make but a pitiful figure near it.

It is needless to describe the rest of the royal mosques of Constantinople, which are built much after the same model as those already mentioned; and the ornaments of all the mosques are of the same kind, only differing in number, costliness, and beauty.

The mosque of Sultan Selim I. at Adrianople, is a building well worth the attention of a traveller. This structure is advantageously situated in the highest part of the city, whence it is seen to great advantage on every side. The first court has four gates, and the innermost three; both of them surrounded with cloisters, with marble columns of the Ionic order, finely polished, and of very lively colours. The whole pavement is of white marble, and the roof of the cloisters di-

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vided into several domes, with gilded balls on the top. In the midst of each court are fountains of white marble, and before the great gate of the mosque is a portico, with columns of green marble, and five gates. The mosque is covered by one prodigious dome of vast extent, and has also four minarets of a prodigious height, gilt on the top, from whence the Imans call the people to prayers. To each of these towers there is but one door, which leads to three different stair-cases, rising to the three different stories of the minaret, in such manner, that three priests may ascend and descend without meeting each other. The lady just mentioned (who was perhaps the only Christian ever permitted to enter the inside of this noble mosque) says, it has two rows of galleries, supported by columns of red and white marble, with marble balustrades; the pavement is also of marble, covered with fine Persian carpets. The walls are beautifully encrusted with Japan china, in flowers of the most lively colours. In the middle hangs a vast lamp of silver, gilt, and about two thousand of a smaller size, which must have a very brilliant effect when all are lighted. Under the large lamp is a pulpit of carved wood, gilt; and just by it a fountain to wash. In one corner is a little gallery, enclosed with gilded lattices, for the Sultan; and at the upper end is a large natch, nearly resembling an altar, raised two steps, and covered with gold brocade. Before it stands two silver gilt candlesticks, holding wax candles, as thick as three flambeaux.

At Salonichi, the capital of Macedonia, there are no less than forty or fifty mosques, some of which are very stately structures, particularly that which was formerly a Christian church dedicated

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to St. Demetrius. This church, according to Paul Lucas, is supported by noble columns of marble, jasper, and porphyry; and underneath it, he says, there is another church equally beautiful; but he was not allowed to see it, because women were employed there in working of silk. The pavement of the upper church is of mosaic work, and in this and the lower building are about a thousand columns. F. Coronelli says, it has three naves, supported by a great number of magnificent pillars.

What has been said may suffice to give the reader an idea of the Turkish mosques, and therefore we shall not mention any more, but proceed to a description of the Seraglio, or palace of the Grand Signior at Constantinople.

When a Turk speaks of the Seraglio, he does not mean the apartments in which the Grand Signior's ladies are confined, but the whole enclosure of the palace in which the Ottoman monarch resides, together with all the guards, women and slaves employed in his immediate service. This vast enclosure entirely occupies the site of the ancient city of Byzantium; being nearly six English miles in circumference, and containing nine large quadrangular courts, besides an incredible number of buildings: most of these edifices are constructed with brick, but the kitchens and treasury are of marble; the whole is covered with lead; and the turrets are adorned with gilded crescents.

This immense pile of building is called the New Seraglio, to distinguish it from the old one built by Constantine. It is situated opposite to Scutari, and, excepting one part, faces the arsenal of Pera. On this side, at a small distance, is a *kiosk*, or

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summer-house, for the recreation of the sovereign in sultry weather. It is an irregular building, of about sixty feet in circumference, and twenty in height, consisting of one large saloon, very magnificently furnished.

There are nine gates to the Seraglio; but the most superb is that which forms the entrance from the square of St. Sophia. From this *porte*, or gate, the Ottoman court takes the appellation of the "Sublime Porte," in all public transactions and records; and on one side of the entrance are pyramids of heads that have been struck off, with labels denoting the crimes of their unfortunate owners.

Over the great gate is an Arabic inscription, in gold and azure, signifying that the palace of the seraglio was built under the reign of Mahomet II. Here is a guard of fifty men, who have no other weapon than a white wand or staff, and who suffer strangers to pass quietly into the first court-yard. On the right side of this court stands an infirmary, where sick people are treated with such tenderness and attention, that the poorer class of Turks have sometimes been known to counterfeit illness, in order to get admittance. On the opposite side stands an old building, which was formerly a Greek church, but is now used as a repository of Turkish armour, trophies, &c. and in this square are, also, the mint, and apartments for the inferior servants of the seraglio.

Through another large gate we enter a second court, where there is also a guard of fifty porters, without arms as well as the former. This is a very handsome square, with several fountains in the midst of grass-plots, which are surrounded with trees, and the walks are paved with marble.

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Round the court runs a low piazza, covered with little cupolas, supported by a great number of marble columns; underneath which the Janizaries range themselves when foreign ambassadors are admitted to audience, and on other solemn occasions. On the right hand are several handsome kitchens, with cupolas that have holes made in them, to let out the smoke. One of the kitchens is for the Grand Signior, another for the favourite Sultana, a third for the ladies of the seraglio, and the rest are for the commandant of the gates, the ministers of the Divan, the Grand Signior's pages, the officers of the palace, the women servants, &c. who altogether make up a very numerous family *. On the left hand is the Grand Signior's treasury, and a stable for his saddle-horses; over which are kept his bridles, saddles, housing, &c. all of which are enriched with jewels and embroidery.

* Numerous indeed they must be, if the accounts be true which travellers give of the provisions they consume. Mortraye says, he was assured by some of the cooks belonging to the seraglio, that they annually consumed thirty thousand oxen, twenty thousand calves, sixty thousand sheep, sixteen thousand lambs, ten thousand kids, a hundred thousand geese and turkeys, the same number of pigeons, and two hundred thousand fowls, besides a prodigious quantity of fish. Tournefort's account is somewhat different; he says, they do not provide much wild-fowl, but besides forty thousand oxen annually consumed, the purveyors are to furnish daily two hundred sheep, a hundred lambs or goats, ten calves, six hundred hens and pullets, two hundred pigeons, and fifty geese. Habesci asserts, from personal knowledge, that nearly ten thousand persons reside constantly in the seraglio; but the grooms, gardeners, and those who constitute the corps of guards, make the major part of that number.

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At the farther end of this court is the hall of the divan, where councils of state are held, and the grand vizir (assisted by his counsellors) determines all civil and criminal causes. Beyond this hall no strangers are admitted, except ambassadors, who pass on to the hall of audience, where the sultan receives them on a most superb throne, enriched with pearls and precious stones. This room is very sumptuously furnished; its floor and sides glitter with gold and azure, and it is adorned with many beautiful paintings, after the Persian manner.

Some travellers have found means of visiting the more interior parts of the seraglio; and among others, one who attended a clock-maker that was employed to repair some curious clocks which had been presented to the sultan. They were conducted, by a black eunuch, into the hall of the haraem, where there was an English clock out of order. This hall was entirely lined with China tiles; the ceiling of the cupola was adorned with azure and gold; and in the middle of the hall was an artificial fountain, the bason of which was of green marble, having the appearance of jasper.

From this hall, our author was conducted through several little rooms, like the cells of a monastery, but furnished in the most costly manner. In one of these apartments was a fine clock, standing on a massy silver table before a looking-glass, the frame of which was silver, gilt, and embellished with foliage in bass-relief. Two lofty stands of massy silver stood on each end of a rich sofa, which had a covering of plain green silk: but on its being uncovered there appeared a very rich brocade with a gold ground; the cushions

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being of green velvet, elegantly embroidered. This chamber was adorned with a profusion of paintings and ornaments, but the lowest part of the window frames were much higher than the tallest man could reach.

On our traveller's return, he was led through several fine halls and chambers, all of which were ornamented with rich Persian carpets, superb sofas, and gilded cielings. About twenty yards from the staircase leading into the gardens, was a pillar of granite, consisting of a single shaft, larger in circumference and about one third higher than Marcian's pillar. It stood upon a square pedestal, and was adorned with some festoons of flowers, and Latin inscriptions; but the latter were almost obliterated.

The gardens, according to Chishull, are wild and uncultivated, affording nothing pleasing to the eye, but what nature has furnished them with; an admirable situation rising into convenient ascents, and capable of great improvement. The whole plat of ground, called the gardens of the seraglio, is entirely covered with cypress and other trees, through which shady walks are cut to the summer-houses.

In the sides of one of the kioschs are three orbicular stones of fine porphyry, the middlemost of which is so highly polished as to reflect the prospect of the seraglio and adjoining city. At the farther end of the gardens are some ruins of an ancient Christian church, and the Grand Signior's aviary, where are kept a species of Egyptian hens, remarkable for having blue gills and feathers, curiously diversified with grey circles and black spots.

Here it may be proper to relate the manner in

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which the seraglio is guarded; it being well known that it is watched with the utmost vigilance. The whole circuit is confined to the care of the *bostangis*, or gardeners, who form the first guard; the second is composed of the *baltagis*, or wood-cutters, who are employed in furnishing firing for the seraglio; to these succeed the guard of white eunuchs, who are about the person of the sultan; and the last corps consists of black eunuchs, who are chiefly employed to guard the women.

All the pages of the seraglio are the sons of Christians, who have either been made captives in war, or stolen, at a very early age, in time of peace: for it is a maxim with the Ottoman court, to be served only by persons who are unacquainted with their country, their parents, and their religion; they being the most likely to be attached to the prince by whom they are fed and protected. The city of Akeska was formerly the rendezvous of those Turkish robbers who used to supply the seraglio, in time of peace, with Christian slaves; and the vicinity of Georgia was very convenient for their purpose, as they could soon assemble two or three thousand horsemen, and make a sudden irruption. Some Christian princes also, used to present a certain number of boys and girls, as an annual tribute, for the service of the Grand Signior; but since prince Heraclius, of Georgia, has withheld this inhuman tribute, and put a stop to the incursions of the Turkish banditti, it is with great difficulty that the usual number of slaves can be kept up.

The haram, containing the apartments of the women, is situated in a very remote part of the seraglio, and looks upon the sea of Marmora. No persons, except the sultan and his eunuchs,

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are permitted to pass the first gate that encompasses the haram; nor is it possible to obtain a sight of the ladies; for if any of them take an excursion into the country, with the Grand Signior, the journey is invariably performed in a barge or close carriage, and a kind of covered way is made with linen curtains, from the carriage or place of embarkation to their apartment. All these women have the same origin as the pages, and are frequently procured by the same means. They are divided into two chambers, and their chief employment consists in needle-work, embroidery, &c. they are also instructed in music, dancing, and such other personal accomplishments as may yield amusement to their master. They are sometimes permitted to walk in the gardens of the seraglio; but on these occasions black eunuchs are placed in every corner with drawn sabres, and others are ordered to walk round the gardens to prevent any persons from looking at them. Sometimes the Grand Signior himself goes into the gardens when his ladies are there; and it is then that they practise all their little arts to endeavour to ensnare his affections.

They not informs us, that in the Grand Signior's bed-chamber belonging to the haram, there are large wax-tapers burning all night, and Moorish women sitting by them. In the morning he changes all his clothes, and leaves them to the lady he slept with, besides whatever money was in his pockets; and on his returning to his own apartments, he sends her a present of money, jewels, magnificent dresses, &c.—When the Sultan wishes to have a fresh companion for his bed, he goes into the apartment of the ladies, and intimates the one he wishes to have; but the ceremony of throwing a handkerchief to the in-

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voured fair, is an idle tale without any foundation.

The number of three thousand five hundred persons who are employed in the service of the imperial stables may, at first, appear extravagantly great; but our surprise will instantly vanish on recollecting that three thousand horses are continually kept for the Sultan, besides a prodigious number that belong to the principal officers of the seraglio. These horses are all procured from Arabia or Egypt, as being in greater estimation than those of Natolia or Romania.—There are also four hundred mules, kept for transporting the Sultan's baggage and that of his suite, when he goes into the country.

In order to give our readers an idea of the magnificence of the buildings of the Turkish nobility, we shall give a description of one of a grand vizir, which he built to receive his royal bride, the daughter of a late Sultan, as we find it described in the letters of lady Wortley Montague, who observes that it is seated on one of the most delightful parts of the canal, with a fine wood on the side of a hill behind it. It is of a prodigious extent, and is said to contain eight hundred rooms, all adorned with a profusion of marble, gilding, and the most exquisite painting of fruit and flowers. The windows are all sashed with the finest crystaline glass brought from England; and here is all the expensive magnificence that can be supposed in a palace founded by a vain luxurious young man, with the wealth of a vast empire at his command.

But no part of this palace is more deserving of admiration than the apartments destined for the bagnios. There are two built exactly in the same manner, answering to each other; the baths, foun-

tains, and pavements, are all of white marble, the roofs gilt, and the walls covered with Japan china. Adjoining to them are two rooms, the uppermost of which is divided into a sofa; and in the four corners are falls of water from the very roof, from shell to shell of white marble, to the lower end of the apartment, where it falls into a large bason, surrounded with pipes that throw up the water as high as the room. The walls are in the nature of lattices, and on the outside of them are planted vines and woodbines, that form a sort of green tapestry, and give an agreeable obscurity to those delightful chambers. The apartment destined for the Sultan, when he visited his daughter, is wainscotted with mother of pearl, fastened with emerald like nails. There are others of mother of pearl and olive wood inlaid, and several of japanned china. The galleries, which are numerous and very large, are adorned with flowers, and porcelain dishes of fruit of all sorts, so well executed in plaster, and coloured in so lively a manner, that it has an enchanting effect. The garden is suitable to the house, where arbors, fountains, and walks, are thrown together in an agreeable confusion; and no ornament is wanting, except that of statues.

Of the magnificence of the Turkish harams we cannot give a better idea than by transcribing the account of Lady W. Montague's visit to the fair Fatima, whose husband was an officer equal in rank to the grand vizir.—"I was met at the door," says our author, "by two black eunuchs, who led me through a long gallery, between two ranks of beautiful girls, with their hair finely plaited, and dressed in light damasks, brocaded with silver; I was sorry that decency did not permit me to consider them nearer; but that thought

was lost upon my entrance into a large room, or pavilion, built round with gilded sashes, which were most of them thrown up, and the trees planted over them gave an agreeable shade; while the jessamines and honey-suckles that twisted round their trunks diffused a soft perfume, and a fountain of sweet water fell into three or four basons, at the lower end of the room, with a most pleasing sound.—The cieling was painted with all sorts of flowers falling out of gilded baskets, and so admirably executed that they seemed really tumbling down.

"On a sofa, raised three steps, and covered with fine Persian carpets, sat the kahya's lady, leaning on cushions of white sattin embroidered; and at her feet sat two girls, about twelve years old, lovely as angels, dressed perfectly rich, and almost covered with jewels. But they were hardly seen near the fair Fatima, so much did her beauty surpass every thing I had ever seen. She stood up to receive me, saluting me after the Turkish fashion, putting her hand to her heart with an air of mingled sweetness and majesty, which no court breeding could ever give. She ordered cushions to be given me, and took care to place me in the corner which is the place of honour.

"She was dressed in a caftan of gold brocade, flowered with silver; her drawers were pale pink; her waistcoat green and silver; her slippers white sattin, finely embroidered; and her broad girdle set round with jewels; upon her head was a rich Turkish handkerchief of pink and silver, and her lovely arms were adorned with bracelets of diamonds.

"Her fair maids were ranged below the sofa, to the number of twenty, and formed a striking resemblance to the pictures of the ancient nymphs.

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Upon a signal from their beauteous mistress, four of them began to play some soft airs on instruments between a lute and a guitar, which they accompanied with their voices, while the others danced by turns.

"When the dance was over, four slaves came into the room, with silver censers in their hands, and perfumed the air with amber, aloes-wood, and other odoriferous scents. After this they served me coffee upon their knees, in the finest japan-china; while the lovely Fatima continued to entertain me in the most polite and agreeable manner. When I took my leave, two maids brought in a basket of embroidered handkerchiefs; she begged I would wear the richest for her sake, and gave the others to my women and interpretess: I retired through the same ceremonies as before."

Our account of the buildings in Turkey might be deemed very imperfect, were we to omit mentioning the public bagnios, which are frequented by persons of all conditions, except those of a very distinguished rank, who have them in their own houses. On entering a bagnio, you come into a large lofty room, in the midst of which, is usually a fountain with a bason. This apartment is surrounded with sofas; and here the people dress and undress, the air not being affected by the heat of the bath, except at the door, which opens into a small warm room, and from thence into a larger one, that is very hot. About the sides of these rooms are usually placed round stone basons, about two feet and a half in diameter, with two cocks, one of hot, and the other of cold water; so that it may be tempered at pleasure; and there are copper bowls for pouring it on the body. In the corners of the inner room

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are small retiring places, in one of which is frequently a cistern of warm water, about four feet deep, large enough for bathing the whole body. All these rooms are covered with domes; and the inner ones receive their light from openings in the dome covered with glass. A few bagnios are solely for the use of the men, others are appointed for the women only; and many of them admit both sexes; the men in the morning, and the women in the afternoon.

When a man enters the hot room, he first applies a certain preparation for taking off the hair from his arm-pits, &c. after which one of the servants of the bagnio begins with chafing or kneading violently, first, the tops of the shoulders, and then, by degrees, the whole body. On his coming to the hands, he pulls the joints of the fingers so as to make each crack separately; then laying the person on his back with his arms across his breast, he raises him forcibly by the back part of the neck, making the greatest part of the vertebræ crack. Then chafing the back a little more, he throws a quantity of warm water over the whole body, and rubs it hard with a bag of coarse cloth, drawn over his hand. The bather is next rubbed over with a soap lather; and this being washed clean off, he puts one towel round his middle, another round his head, and a third, over his shoulders; then returning to the great room, he usually smoaks a pipe, drinks coffee, and, perhaps, eats some fruit before he dresses. This method is practised in much the same manner, not only through all the Turkish dominions, and in Persia, but also in India, where it is esteemed a great luxury, and has an extraordinary effect on the spirits.

The Turkish houses, in general, are composed

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of apartments on each of the sides of a square court, and are usually constructed with stone; but in many places they are only built of wood.

These structures consist of a ground floor, which is generally arched, and an upper story flat on the top, and either terraced with hard plaster, or paved with stone. The cielings are of wood, neatly painted, and sometimes gilded, as are likewise the pannels of some of the rooms, the cupboard doors, and the window shutters. The gildings of all these have a very agreeable effect: besides over the doors and windows, within the houses of the Turks, are inscribed moral passages out of the Koran, or verses of their own composing, or taken from some of their most celebrated poets.

The court formed by the four sides of the house is neatly paved, and has generally a bason, with a fountain in the middle; and on one or both sides is a small spot left unpaved, for a kind of garden, which however seldom exceeds two or three yards square. The verdure here produced, with the addition of flowers in pots, and the fountain playing, would be a very agreeable sight to the passenger, were there openings to the street, through which these might be seen; but they are entirely shut up with double doors, so contrived, as that when opened none can look into the inner court; and there are no windows to the street, except a few in the upper rooms; so that nothing is perceived but dead walls, which give the streets, in all the Turkish towns, a very disagreeable appearance.

Most of the houses of people of distinguished rank, have an arched alcove within their court yards open to the north, and opposite to the fountain. This alcove has its pavement raised about a foot and a half above that of the yard. Between it

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and the fountain, the pavement is generally formed of mosaic work of various coloured marble, as is also the floor of a large hall, which has a cupola roof, and frequently a fountain in the middle, or at one end.

The bazars, or exchanges, are noble buildings, some of which extend half a mile in length, with an arched roof, and are kept extremely neat. These contain three or four hundred shops furnished with all sorts of rich goods, which are exposed to sale in the same manner as in Exeter Exchange in London. The pavement is also kept remarkably neat, and the shops are as clean as if just painted. Idle people of all sorts walk here for amusement, as well as those who come to buy; and coffee and sherbet are cried about, as oranges and apples in our theatres. The Bezistan or jewellers quarter, is another building of the same kind, supported on pillars. Here are exhibited vast quantities of diamonds and precious stones, rich embroideries, and horse furniture, glittering with gold and jewels. These are the principal places for shop-keepers.

The public hans, or caravanseras, are extremely magnificent, many of them taking up a large square, built round with shops under stone arches, where poor artificers are lodged gratis. They have always a mosque joining to them. The body of the han contains a noble hall, capable of holding three or four hundred persons; the court is extremely spacious, and the cloisters round it may be said to resemble some of our colleges. In many places these hans are appropriated to the use of travellers, who are permitted to lodge and deposit their goods in them free of expence.

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INVENTIONS AND DISCOVERIES OF THE ANCIENT INHABITANTS OF TURKEY IN EUROPE.

EUROPEAN Turkey was anciently the country of philosophers as well as of heroes; and the ancient Greeks surpassed all the nations of the earth in their inventions of, and improvements in, the arts and sciences; from them the rest of the world seem to have derived all their systems of knowledge; and they were no less celebrated for arts than for arms. It therefore can hardly be expected, in a compendium of this kind, that mention should be made of all the great names that anciently adorned Greece, upon which subject many thousand volumes have been written. As, for that reason, an abstract of the philosophical and military transactions of the Greeks can by no means be attempted in this work, we shall merely notice the most celebrated Greek philosophers, and the most famous physicians, architects, sculptors and painters, without enumerating the many illustrious historians, orators, and poets, who are almost universally known and admired.

Thales, who was a native of Phœnicia, is said to have brought the knowledge of geometry into Greece, and was the first who demonstrated, that the angle at the circumference of a circle, subtended by the diameter, is always a right angle. This discovery led him to find out other properties of the circle, and afterwards to trigonometry, or the art of measuring heights and distances by means of triangles. Pythagoras, who, according to Jamblichus, had learned a great deal from the pillars of Mercurius, taught geometry to his disciples. He used it in explaining sensible and material things; as he did of numbers and arith-

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metic, to make his scholars conceive things which are not objects of the senses. He discovered that famous theorem, relating to the square of the hypotheneuse being equal to the squares formed by the base and cathetus. Euclid, who lived in the time of the first Ptolemy, and whom we must not confound with another philosopher of that name, the disciple of Socrates, rendered himself famous by his elements of geometry. Aristæus, who is called the ancient, to distinguish him from a later philosopher of the same name, wrote five books upon the conic sections, which are entirely lost. It is not exactly known at what time this geometrician lived; some make him contemporary with Euclid. Apollonius collected all that Aristæus, Eudoxus of Cnidus, Menecmus, Conon, Thrasideus, and some others, had written before him. He first gave the three conic sections the names of parabola, hyperbola, and ellipsis. All these authors prodigiously improved the geometry of the first age of literature, and, by its assistance, carried their enquiries and knowledge in the sciences to a much greater extent.

Astronomy was cultivated with great care by the Greeks. Chiron, the father of the Grecian astronomy, lived 1500 years before the Christian era. Thales added a great many useful discoveries in astronomy, particularly the observation of the equinoxes, and solstices, and the motion of Ursa minor about the north pole. Anaximander, his disciple, knew the dimensions of the sun and moon, and taught the Greeks the obliquity of the ecliptic. Indeed, he differed and separated from his master, as to the diurnal motion of the earth. In this he paid too great a deference to his senses, and established the opinion of the

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earth's immobility, and of the diurnal revolution of the sun about it. Eudoxus, contemporary of Meton and Hiparchus, adopted the system of Anaximander. These astronomers placed the earth in the centre of the universe, and enclosed it in three different regions of the air; the lower, bound by the reflection of the sun's rays; the middle, where the clouds are; and the higher, above which they placed the region of elementary fire, a luminous body sovereignly hot. With regard to the disposition of the orbits of the planets, they first placed that of the moon, and above the moon they placed the orbs of Mercury, Venus, Mars, Jupiter, and Saturn. All these orbits they supposed spherical, and perfectly diaphanous, and enclosed within one another. The use they made of these heavens, was to account for the motions of the planets from west to east. Eudoxus and Hipparchus placed the fixed stars, which were higher than all the planets, in the firmament, as in a vault concentric to the earth. This they supposed the first mover, which carried about with it all the inferior heavens, to make them move in twenty-four hours from east to west. Hipparchus, also greatly improved astronomy by making a catalogue of the fixed stars, the first attempt of that kind; and which, according to Pliny, was an undertaking worthy of a god.

Philosophy was diligently cultivated by the Greeks. Thales, while he resided at Miletus, taught the Greeks the first elements of philosophy; and perfected his system by the observations he made in Egypt. From the great discoveries he made in geometry, astronomy, and the doctrine of the universe, he acquired the magnificent title of Wise. His principle was, that water is the chief material of which natural bodies are composed, and into which they are resolved. He imagined

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the earth to be a great mass, floating on a vast abyss or ocean of water; and from hence he deduced the cause of earthquakes, and the irruption of springs. He conceived God to be the author of all natural motion, and the soul that animated the universe. The magnet and jet he imagined to have souls, because of their attracting virtue. To him is ascribed the invention of measuring the height of pyramids by their shadows; and it was he who first discovered the natural reason of eclipses, which before were looked upon as ominous, and presages of some calamity. He foretold that which terminated the five years war between the Lydians and the Medes, when those poor people, frightened at the strange darkness, and believing the sun hid himself to avoid seeing the slaughter, laid down their arms and composed their quarrels. Besides Thales, Solon, Chilon, Pittacus, Bias, Cleobulus, and Periander, had the same title bestowed upon them. And as Thales was the first, who, by his travels into the eastern countries, became acquainted with philosophy, and introduced it into Greece, these were the authors of several excellent laws and schemes of government: and as the title of Wise was conferred on the first for his excellent skill in geometry, and the knowledge of nature, so it was given to the others for their excellent precepts in morality and politics.

The disagreement among the philosophers of this age produced several sects; these had a double origin; the one from Anaximander, the disciples of Thales, and, therefore, called Ionic; and the other from Pythagoras, that prince of philosophers, which, from the place where he held his school, was called the Italic. Anaximander

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varied from the doctrine of his master, and instead of water, made infinity the principle of all things, but has not given any satisfactory explanation of his meaning. Besides him, there were Anaxagoras, Heraclitus, Democritus, and Anaximenes; the first of whom acknowledged an eternal Being; the second, fire; the third, atoms; and, the last, air, for the first mover.

Socrates, an Athenian, was the author of the second sect: his principal study was virtue, morality, and the regularity of mens' lives and actions. He did not confine his lectures to a particular place; but, wherever he was, his conversation was always pleasant and instructive. The camp, the forum, the public streets, and the houses of his friends, were so many schools of knowledge and virtue. For his great wisdom, his manly and noble thoughts, and the ease and sweetness of his expression, he was admired by all men, and esteemed the prince of philosophers. He had a true notion of the divine nature, and vigorously opposed polytheism; for which his enemies reproached him as an infidel, and an enemy to the gods, and condemned him to death. He drank the poison with such majesty of soul, and such serenity of mind, as showed the absolute empire of his reason over his passions, and the impotence of the malice of his enemies, who could not disturb the tranquillity of his mind, or make him act unworthy of himself even in the trying moments of dissolution.

The succession of the Ionic philosophy, which before Socrates, was single, was soon afterward divided into several schools and sects, some of which were of less note, and lasted but a short time; others were more considerable, and of longer continuance; of the former kind were the

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Cyrenaic, Megaric, Eleac, and Eretriac sects; of the latter were the Academic and the Cynic, which gave birth to the Peripatetic and Stoic.

Aristippus, a disciple of Socrates, was the chief of the Cyrenaic sect. He placed the sovereign good in pleasure, and thought virtue only commendable, as it conduced to acquire it. The distinction of right and wrong, just and unjust, he looked upon as arbitrary, not established by nature, but law and custom. As his principles were vicious, so his life was conformable to his doctrine. His good humour, however, rendered him agreeable to Dionysius, the tyrant of Sicily, while the severity of Plato, which he unjustly called moroseness, offended that haughty prince. Aristippus acknowledged but two passions, pleasure and grief, as the spring of all human actions; and these are diversified according to the temper and complexion of every person. He derided the calmness and serenity of the mind, or exemption from all passion, in which others placed human happiness, regarding this as a mere inactivity, and a tiresome indolence. He likewise derided the plain and simple way of living observed by his old friend Antisthenes, and admired the ease, and voluptuousness of the Sicilian court.

The Megaric sect was instituted by Euclid, who, according to most authors, was a native of Megara; though others say he was born at Geta, a city of Sicily. He affected litigious disputes, and was, therefore, told by Socrates, that he knew how to contend with sophists, but not with men. Accordingly he instituted, suitable to his contentious humour, a sect, which at first was called Megaric, from the place of his birth, and afterwards Eristic, from its litigious and sophistical

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nature. Afterwards it was called Dialectic; which name Dionysius, a Carthaginian, first gave this sect, because their discourse consisted of question and answer.

Euclid affirmed that there was but one good, which is called by several names; sometimes prudence, sometimes God, sometimes the mind, and the like; and asserted there was nothing opposite to good.

His arguments were not founded on assumption, but inference: and would not admit of disputation by similitude, asserting that it consisted of similar or dissimilar; if of similar, it was the most proper method to examine the things themselves to which they are similar: if of dissimilar, the comparison is of no use.

The Eleac sect was instituted by Phædo, an Elean, of a noble family. In his youth he had the misfortune to be taken by pirates, who sold him as a slave. Socrates often observed him, and, being pleased with his aspect, persuaded Cebes, according to Aulus Gellius, though Lærtius says it was either Alcibiades or Plato, to buy him; from which time he addicted himself diligently to philosophy, was a constant disciple of Socrates, and so much esteemed by Plato, that he called that most excellent discourse of the immortality of the soul, after him, Phædo.

But the most eminent of all the sects derived from Socrates was the Academic, who took their denomination from the place where their school was erected. Plato was the chief of this sect. He had a plentiful fortune; and after being for some time a scholar of Socrates, he travelled into different parts in order to gather fresh knowledge from the greatest masters of his time. In Italy he

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studied the doctrine of Pythagoras, and seems to have taken many things from the writings of Moses, and other Hebrew prophets, which he probably met with during his travels in Asia. Some persons regard him as the inventor of dialogue, but others say he only refined and polished it. The analytic method of reasoning, is generally ascribed to him. Instances of this method are to be found in the writings of Euclid, Apollonius, Pappus, and other ancient geometrical writers. Plato held mathematical learning of the greatest use in all parts of human knowledge, requiring that all his scholars should be previously instructed in the elements of geometry.

The philosophy of Plato was held in great veneration during the first ages of Christianity, which, perhaps, proceeded from his teaching that God had one only begotten son, whose power extended over all creatures. In short, the notions of this great philosopher agree, in many points, with the tenets of the Christian religion.

Plato held that the soul was immaterial and immortal; that it was free and independent, but subject to necessity or fate. He diligently cultivated the science of morality, which he has diffused through all his works. His principles, as far as we have been able to collect them from his writings, may be reduced to the following heads:

"The end and aim of all human actions is some good; and there is a sovereign good, which every soul pants after. This sovereign good must needs be perfect, solely sufficient by itself; and such as whoever knows it, ardently seeks the possession of that alone, without the least concern for any other things, but such as are made perfect by

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those which have some relation to it. But this can only be found in that infinite Being, who is the father and original cause of all other beings; who not only gives to things known whatever they contain of truth, and to intelligent beings the faculty of knowing them; but who is also the author of their existence and essence, being himself above all essence, both in respect to time and power. Without the knowledge and possession of this good, all other things are useless. And though all men desire it, and have some idea of it, yet they do not well know what it is: nor can they thoroughly comprehend it, either by their own meditation, or by any certain and invariable information from others: for which reason there are but very few men who arrive at happiness in his world, and none who can obtain it in perfection.

"All the happiness we can possibly arrive at here below, amounts to no more than the enjoyment of a good, which is only the production and emanation of that sovereign good, or something that resembles it. This good, which may be compared to the light and eye-sight, is like the image of the sun, but not the sun itself; this good, is knowledge and truth, which produce sanctity and justice, by which we are, as far as possible, united and made like to God: and also the love of that superlatively excellent Being, from whence results a pleasure that is pure, virtuous, and without remorse. If the soul retires pure, unsullied by any contagion of the body, as not having willingly had any commerce with it, but, on the contrary, having, as it were, always shunned it, and been always recollected within itself by continual meditation; that is, by truly philosophising, and effectually learning to die, for philosophy is the preparation

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for death: if the soul, retires in this disposition, it goes to a Being like itself; to a Being divine, immortal, and replete with wisdom, where it lives in the enjoyment of wonderful felicity, delivered from all its errors, ignorance, and fears; from all those passions and affections, which once tyrannized over it; and from all the other evils attending human nature; and leads a truly celestial life to all eternity. So that besides the most glorious and most certain rewards, that good men receive in this world, both from God and man; and the good things which probity naturally procures for those who constantly practise it; they receive, after their deaths, rewards both immense and innumerable. Whereas the wicked are punished, in another life, proportionably to the crimes they have committed in this."

After the death of Plato, his disciples divided into two sects; the first remained in the old academy, the other took possession of the Lycæum. The rest were called Peripatetics, of whom Aristotle, a native of Stagyra, was the chief. He was the first of the ancient philosophers who gave us a complete methodical system of morality, at least, of those whose writings we have left. He made great improvements in logic, as well as other parts of philosophy; invented categories, formed the syllogism, and determined several modes and figures; detected the arts of sophistry, wrote a great number of books on metaphysics, physics, natural history, &c. The fate of the writings of this philosopher is strange; and it is surprising to find men judge so differently of the same thing in the same age: men have been excommunicated and treated as heretics for reading them to their disciples: at other times they have

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been introduced into the schools and universities, and no other philosophy suffered to be taught. They have, in one age, been looked upon as the standard of truth, their author has been stiled the genius of nature, and his performances the highest pitch of human wit. At other times, this philosophy has been trested as trifling, verbose, empty, and litigious; and the discoveries of the moderns have demonstrated, that his opinions, with regard to the phænomena of nature, were altogether erroneous.

Another branch of the school of Socrates were the Cynics. Antisthenes was the founder of this sect, and had, among others, the famous Diogenes for his scholar. What Mr. Bayle has said of Diogenes, may be generally applied to the philosophers of this sect, "That they were of the number of those extraordinary persons, who carry every thing into extremes, without excepting even reason itself; and who verify the maxim, that there is no great genius without a mixture of folly. They had learned from Socrates, that morality was the most useful of all the sciences, and what deserved our greatest care and application. From this true principle, they absurdly concluded, that logic, natural philosophy, geometry, music, the liberal arts and sciences; in short, every thing that did not immediately relate to the science of morality, was to be despised and neglected.

The fundamental maxim of their doctrine was, to live in conformity to the rules of virtue, which is sufficient to make men happy. But the consequences they drew from thence, were, in some things, too rigid, and in others too remiss. The gods, said they, have need of nothing; this is their proper and natural condition: those, there-

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fore, which need only a few things, the most resemble them. In order to procure this happy independence, and to show with what an utter indifference they looked upon riches, pleasures, honours, &c. they pretended that men ought entirely to renounce all the conveniences of life, and voluntarily reduce themselves to the most extreme poverty; and they accordingly pursued this maxim in their manner of living: a long beard, a cloak, a staff, and a wallet, made up the whole of their attire, equipage, goods, and chattels. Diogenes, for his part, would have no other habitation than a tub; his wooden cup too, when he found he could drink out of the hollow of his hand, was thrown away. Antisthenes said, "He had rather lose his senses, than be sensible of the least pleasure." They thought themselves entitled freely to make use of whatever came in their way, without troubling themselves whether they had the owner's consent or not; which practice they justified in this manner: "All things, said they, belong to the gods; but the sages are friends to the gods, and all things are common among friends; therefore all things belong to the sages." They also ridiculed all human establishments, believing themselves bound by no other law than the law of nature, of which they had very erroneous notions.

The sect of the Stoics had its origin from that of the Cynics. The author of it was Zeno, who, having first been a scholar of Crates, and afterwards a hearer of other philosophers, at last instituted this new sect. This philosophy formed some great men, and charmed a great number of people, by its proud and ostentatious principles. It aims at nothing less than fortifying men against bodily torments, and arming them against the

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blows of fortune. Zeno imagined the world to be an animal; whereof the supreme God was the soul, or the active principle; and matter the passive principle. That eternal intelligent Being which produced all things, and directs them by his providence, was, in the opinion of the Stoics, nothing but a fiery substance; or, as it were, an operative mechanic fire; whereof some parts animated plants, beasts, and men; whilst others, more subtle and elastic, made the gods in the sun and in all the stars. They believed the gods themselves, (the supreme God only excepted,) would one day be destroyed by fire, with the rest of the world; which, in their opinion, was to undergo several conflagrations, after a certain period, or revolution of years. They held, that the souls of men were, after death, re-united to that subtle air, from whence they had been taken; but they believed them corruptible, and made them subsist no longer, at farthest, than the conflagration of the world: nay, some of them did not allow even this privilege but to the souls of their sages. They placed the sovereign happiness of man in virtue, as the only means of procuring him a solid and lasting pleasure. The Stoics were the last of all the philosophers derived from Thales, and conclude the succession of the Ionic school.

Pythagoras, whom most believe a Samian, was the founder of the Italic sect. He continued a great while in Egypt to learn their mysteries. Some authors tell us, that he was made a prisoner by Cambyses, who sent him to Babylon, where he became familiar with the Magi and Chaldeans, and was acquainted with the prophet Ezekiel. None of the philosophers had more disciples than Pythagoras. He enjoined an exact submission to all he

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said, and imposed a rigorous silence on his scholars for two years. Temperance was the virtue he most earnestly recommended, as absolutely necessary to bring the body to an entire subjection. He held the pre-existence of the soul, and the metempsychosis, or migration of souls from one body to another. Of this sect were Empedocles, Archytus, and Philolaus; and to them, it must be owned, we are indebted for the true system of the universe, which places the sun in the centre and the earth in the planetary chorus.

"Pythagoras," says Mr. Bayle, "laboured usefully to reform and instruct the world. His eloquence must have been very powerful, since his exhortations influenced the inhabitants of a large city, famous for its corruption of manners, to banish luxury, and live according to the rules of virtue. He prevailed even with the ladies to part with all their fine clothes and ornaments, and to present them as an offering to the principal deity of the place. It was his principal care to correct the abuses committed in the marriage state; without which, he thought, neither public peace, liberty, a good form of government, or other things of the like nature, for which he assiduously laboured, could make the people happy. His affection for the public good made him offer his instructions to the great at their own palaces. He had the good fortune and glory of having formed disciples who proved excellent legislators; such as Zaleucus, Charondas, and others.

He had two methods of teaching: the one for strangers, which was obscure and enigmatical; the other for his own disciples, which was plain and instructive. It is not known whether he left any thing in writing; but certain it is, that we

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have now nothing of his extant. The little poem, called "The golden Verses of Pythagoras," was composed by one of his disciples, which some affirm to be Lysis, others Empedocles. As he made great use of arithmetic, or the science of numbers, in expressing his thoughts; he said that virtue, health, friendship and even God himself, were nothing but harmony.

The sects which sprung from the Italic, may be reduced to four, the Heraclitian, the Eleatic, the Sceptic or Pyrrhonian, and the Epicurean.

Heraclitus, by the advantage of a good genius, was master of that knowledge, which others acquire with difficulty and painful researches. His contemplative disposition, and contempt for the world, made him love retirement and solitude. Accordingly, he withdrew himself from the society of men, and spent his time on the top of a solitary mountain, bemoaning the follies and vanities of the world.

He held that fire is the principle of all things; for, of fire, all things are made, and into fire all things shall resolve. That all things are made by contrariety, and the whole flows like a river. That the universe was bounded, and that there is one world which was made of fire, and shall again be set on fire, at a certain period, for ever, and that this is done by fate. That the soul of the world is an exhalation of the humid parts thereof, and that the essence of fate is a ratio, or proportion, permeating through the universe, which fate is an ethereal body, the seed of the generation of all things.

This opinion, that fire is the principle of all things, was also asserted by Hippasus the Pythagorean, whom Plutarch joins with Heraclitus;

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and it is probable, that Heraclitus, being his disciple, received it from him.

Democritus, the chief of the Eleatic sect, was of a temper very different from that of Heraclitus: he had a smiling countenance, and diverted himself with laughing at the ridiculous passion which men discovered for trifles, the diligence and pains they used to obtain them, and the regret and grief they showed upon any loss or disappointment. The people of Abdera, among whom he lived, observing him to laugh frequently, began to fear he was mad, and sent for the famous Hippocrates to cure him; but that celebrated physician was soon convinced that he, instead of being a lunatick, was one of the wisest of men. Democritus was the inventor of the doctrine of atoms, and a vacuum, or the corpuscular philosophy.

Pyrrho was the chief of the Sceptics. He affirmed men could only judge by appearances of truth and falsehood, and, therefore, concluded, that the mind ought to continue in suspense, and not determine any thing. All the subtility of this sect lay in discovering reasons for diffidence and distrust, in things which appeared plain and evident.

The author of the last sect was Epicurus, who is said to have written more than any other of the philosophers. He placed the sovereign good in virtuous pleasure. The wrong interpretation of his opinions, and the abuse his disciples made of them, has brought his philosophy into disrepute, and caused it to be decried as the source of vice and immorality. He held atoms and a vacuum to be the principles of things, and asserted, contrary to Aristotle, and others, that the world was not eternal; nay, he affirmed, there were so

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sible marks of its newness; urg among ot things, the rise of the arts and dences as deniable proofs of its small continuance. Luc tius, in his elegant poem, has given us his do trine of the universe, providence, &c.

Medicine was introduced into Greece about 15 years before the Christian era, by Melampus, Argive; and Æsculapius and Hippocrates, the m celebrated of all physicians, were natives Greece. Architecture, as appears from the ve names of the principal orders, owes its perfecti to the Greeks. Though sculpture had its orig in Asia and Egypt, it derived its lustre and p fection from Greece, where Pericles and a m titude of other excellent sculptors laboured emulation of each other, to render sculpture h nourable, by an infinite number of works, whi have been the admiration of all ages. T most eminent sculptors were Phidias, Lysipp Praxiteles, Myron, Scopas and Polycletes. Apol dorus, a painter of Athens, who lived about t 93d Olympiad, discovered the secret of rep senting to the life, and in their greatest beau the various objects of nature, not only by the corre ness of his design, but principally by the perf tion of the colours, and the proper distributi of shades and lights. Zeuxis, the pupil of Ap lodorus, appears to have exceeded his mast Parrhasius, and was the rival of Zeuxis; and them succeeded Apelles of Cos, Aristides Theban, and Protogenes the Rhodian, who c ried the art of painting to the greatest perfect it ever arrived at.

END OF VOL. III.

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